HP Vectra User's Guide

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WELCOME TO YOUR HP VECTRA PC

Congratulations on the purchase of your new Hewlett-Packard Personal Computer. Your high-performance HP Vectra PC provides:

- a PentiumTM Pro processor in a Zero Insertion Force (ZIF) socket for easy processor upgrades

- processor-integrated level-two cache for improved performance

- 16 MB of ECC (error correcting code) memory, upgradeable to 256 MB

- an Ultra VGA PCI (Peripheral Component Interconnect) video controller with 2 MB of video memory (upgradeable to 4 MB)

- an integrated Enhanced IDE (Integrated Drive Electronics) controller on the PCI bus supporting Fast IDE and Standard IDE

- an integrated Ultra SCSI controller on the PCI bus supporting Fast-20 SCSI-2 (up to 20 MB-per-second data transfer rate) and SCSI Plug and Play (SCAM) compliant devices

- a 32-bit PCI 100VG/10BaseT Ethernet LAN controller

- seven mass storage shelves:
  - five front-access shelves
  - two internal shelves

- six slots for accessory boards:
  - three 32-bit PCI (Peripheral Component Interconnect) slots
  - two 16-bit ISA (Industry Standard Architecture) slots
  - one combination ISA or PCI slot

- a quad-speed CD-ROM drive on the SCSI bus

- an integrated SoundBlasterTM 16 audio interface on the ISA bus

- headphones jack, microphone jack, and volume control on the front panel

- MIDI/joystick interface connector, audio Stereo In jack, and audio Stereo Out jack on the rear panel

- Wavetable upgrade connector on the system board

- one SCSI connector, one parallel port, and two serial ports on the rear panel

- System BIOS and Video BIOS stored in Flash ROMs (for easy upgradeability)

- BIOS support for ISA "Plug and Play" accessory board configuration

- Optimized for 32-bit operating systems.

NOTE	The advanced processor installed in your HP Vectra PC provides the best performance when used with 32-bit operating systems and applications.

1 SETTING UP YOUR PC

This chapter leads you through the first time installation of your HP Vectra PC.

UNPACKING YOUR PC

1 When you receive your PC, unpack all of the components:

- the computer and power cords
- the display and its video cable
- the keyboard and mouse
- the manuals and disk kit.
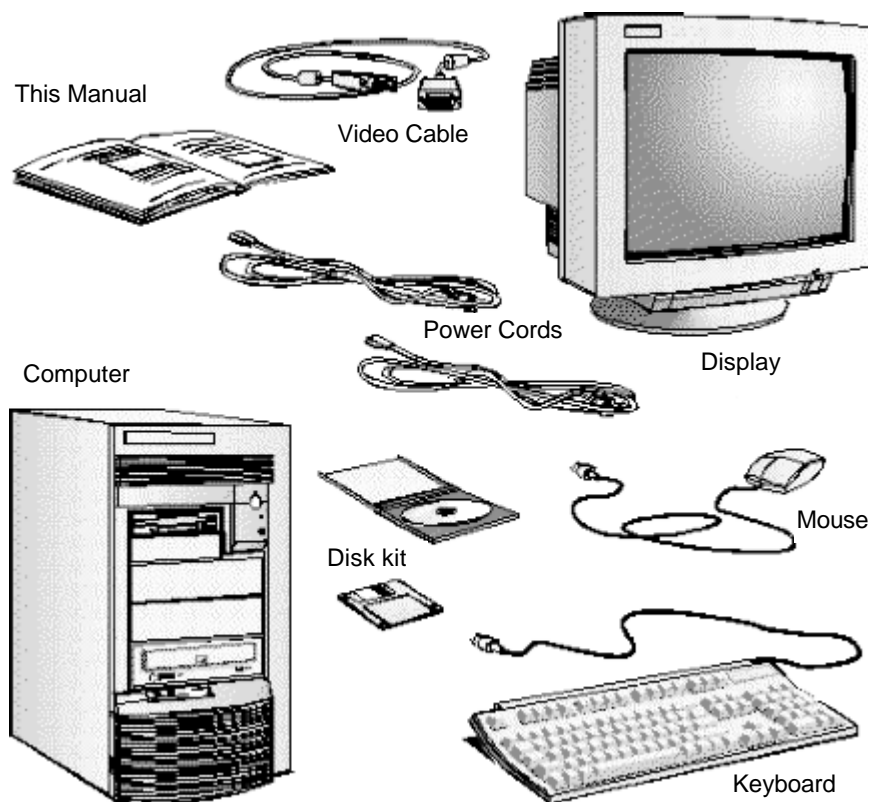
NOTE	Device drivers, HP utilities, and an online Network Administrator Guide are provided in a disk kit.

2 Place the PC on (or under) a sturdy desk with easily accessible power outlets, and enough space for the keyboard, mouse, and any other accessories.
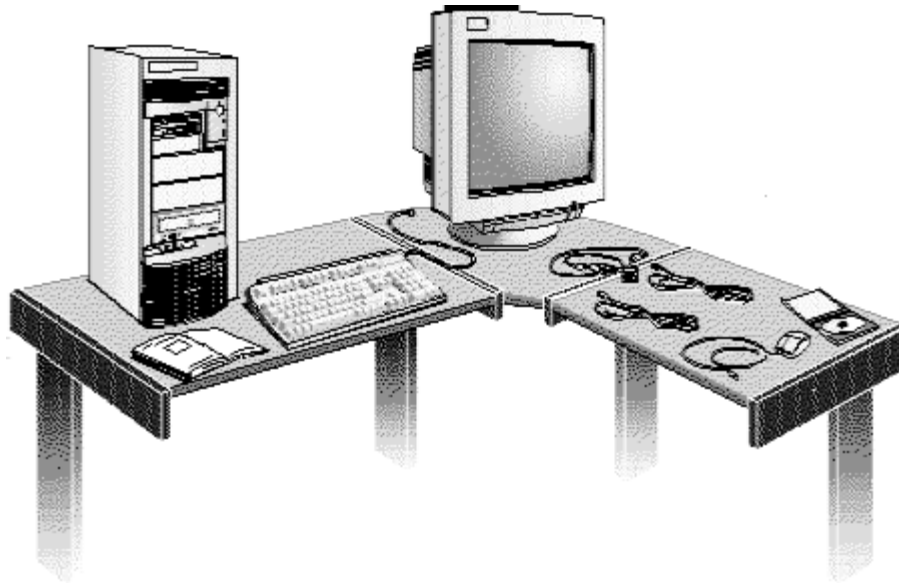
3   Position the PC so that its rear connectors are easily accessible.

4   Place the display next to the computer.

Installation Tools

No tools are required to install your PC. However, if you plan to install a disk drive or an accessory board inside your PC, you will need a flat-blade screwdriver. See chapter 3, *How to Install Accessories Inside Your PC*, for more information on installing accessories.

> **WARNING:**   **If you are in any doubt that you can lift the PC and the display safely, do not try to move them without help.**

CONNECTING THE DISPLAY, MOUSE, AND KEYBOARD

1   Connect the display, mouse, and keyboard to the back of the computer. The connectors are shaped to go in one way only.

2   Tighten the display cable attachment screws.

Mouse Connector

Keyboard Connector

Display Connector
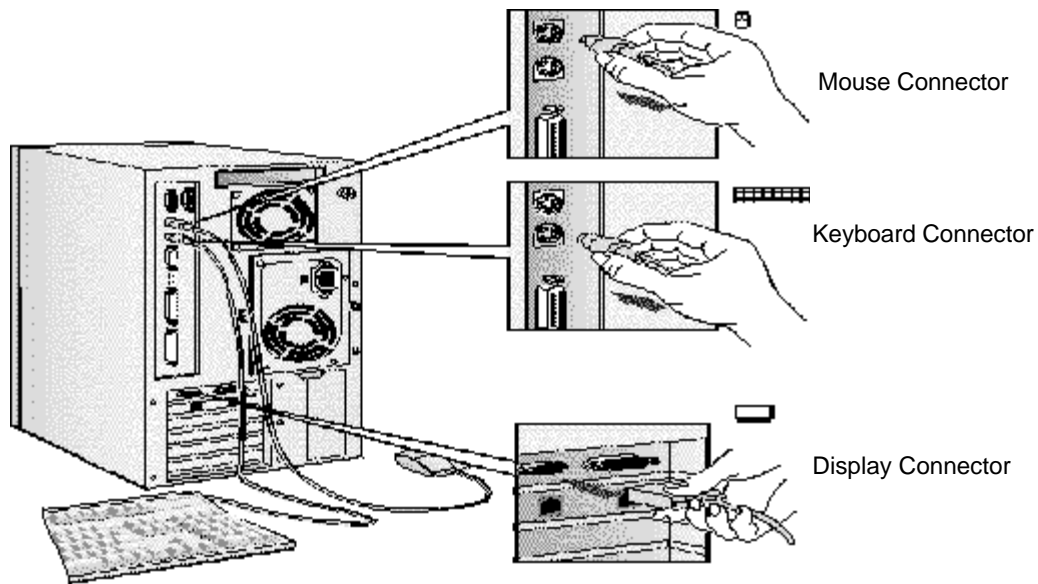
CONNECTING TO A NETWORK

The LAN Adapter installed in your PC may have two RJ-45 connectors (one for 100-Mbit/s operation and one for 10-Mbit/s operation) or one RJ-45 connector (supporting both 100-Mbit/s and 10-Mbit/s).

The LAN Adapter can automatically detect which connector or network type is being used.

1   Connect the RJ-45 plug on your network cable to the 100-Mbit/s or 10-Mbit/s LAN connector on the LAN Adapter as appropriate for your network type. Push the plug into the connector until the plug clicks into place.

100-Mbit/s

Connect the network cable to the 100-Mbit/s or 10-Mbit/s LAN connector

(Your LAN adapter may have one connector which supports both network types.)

10 Mbit/s
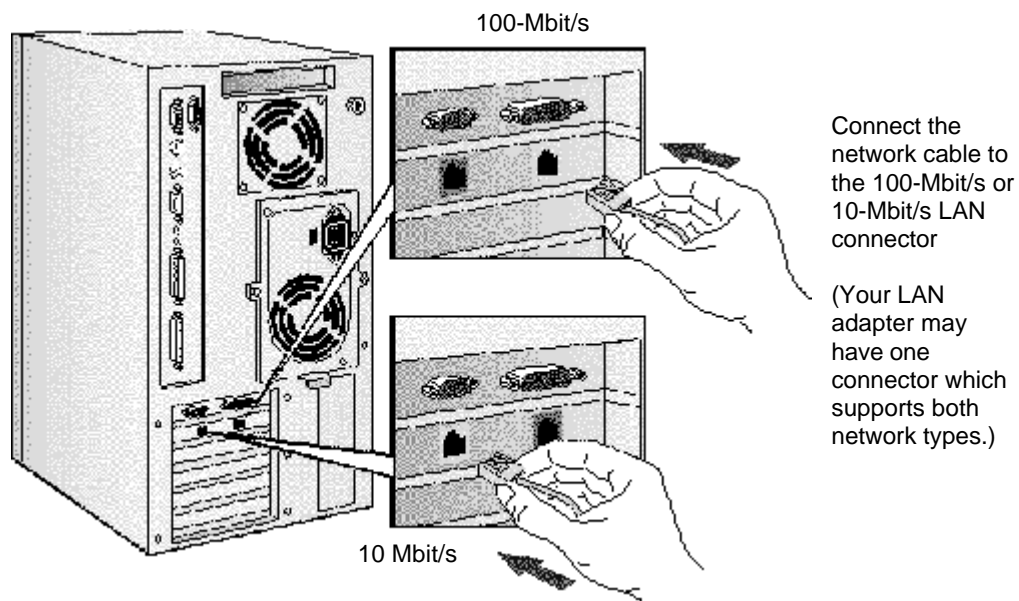
2   Attach the other end of the LAN cable to a hub (or into a wall jack that is connected to a hub).

Let your Network Administrator know you are connecting your PC to the network. Refer to the online Network Administrator Guide (provided with the disk kit) for instructions on setting up your PC for a LAN connection.

CONNECTING A PRINTER

If you have a printer, connect its cable to the back of the computer and tighten the attachment screws. Use these connectors:

- Parallel (25-pin parallel connector) for a parallel device
- Serial A (9-pin serial connector) for a serial device
- Serial B (9-pin serial connector) for a second serial device.
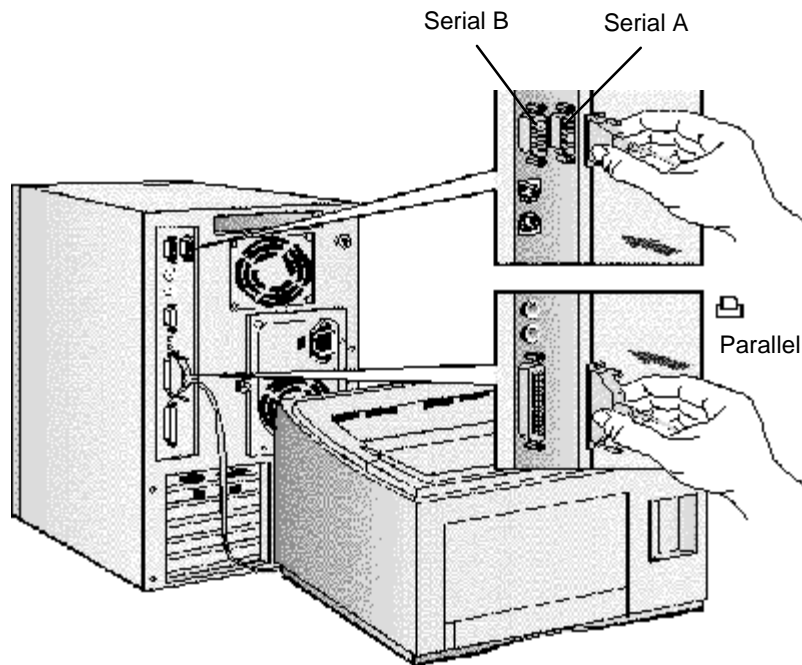
CONNECTING AUDIO ACCESSORIES

Your PC has a Headphones jack and a Microphone jack on the front panel. An audio Stereo In jack, an audio Stereo Out jack, and a MIDI interface connector are located on the rear panel.

MIDI connector

Stereo in jack
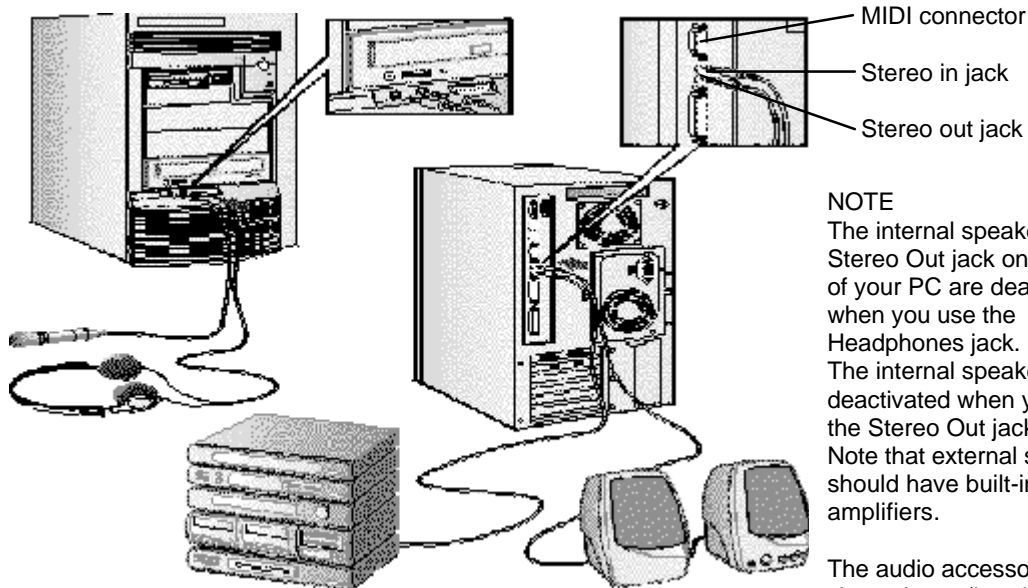
Stereo out jack

NOTE
The internal speaker and the Stereo Out jack on the rear of your PC are deactivated when you use the Headphones jack.
The internal speaker is deactivated when you use the Stereo Out jack.
Note that external speakers should have built-in amplifiers.

The audio accessories shown h ere (headphones, microphone, speakers, and hifi system) are not supplied with your PC.

WARNING: **To avoid discomfort from unexpected noise, always turn the volume down before connecting headphones or speakers.**
Listening to loud sounds for prolonged periods may permanently damage your hearing.
Before putting on headphones, place them around your neck and turn the volume down.
When you put on the headphones, slowly increase the volume until you find a comfortable listening level, and leave the volume control in that position.

CONNECTING A SCSI ACCESSORY

Note that Ultra SCSI mode is disabled automatically when an external SCSI accessory is connected to your PC.

1   Refer to the manual provided with the SCSI accessory for instructions on selecting a SCSI address. You should assign an unused SCSI address to the accessory.

SCSI addresses range from 0 to 7, with SCSI address 0 used by the first SCSI hard disk drive and SCSI address 7 reserved for the integrated SCSI controller.

NOTE:	You don't need to set a SCSI address for Plug and Play SCSI devices (SCSI devices which support the SCAM protocol).

2   Connect the SCSI accessory to your PC's external SCSI connector with a shielded SCSI cable. (Note that Ultra SCSI is automatically disabled when an external SCSI accessory is connected.)
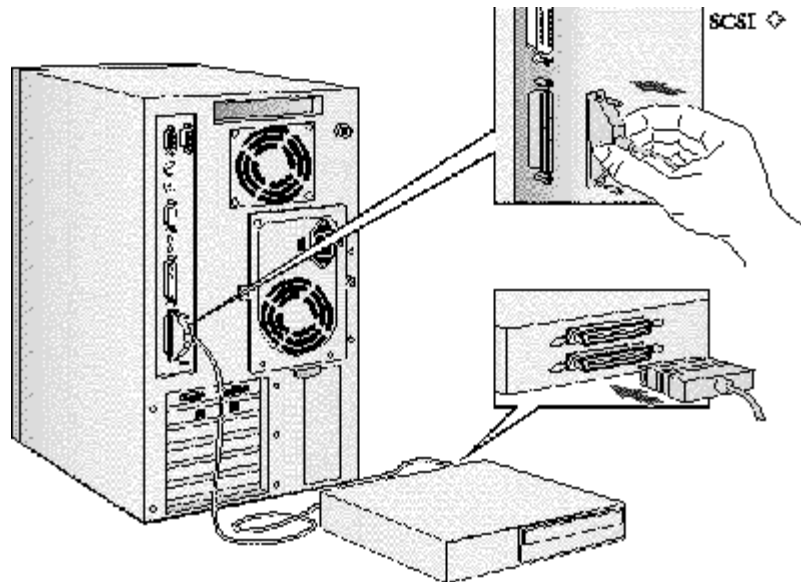
3   Make sure the SCSI accessory is terminated correctly—either internally or by a terminating resistor (refer to the manual provided with the SCSI accessory).

Make sure the SCSI accessory is terminated
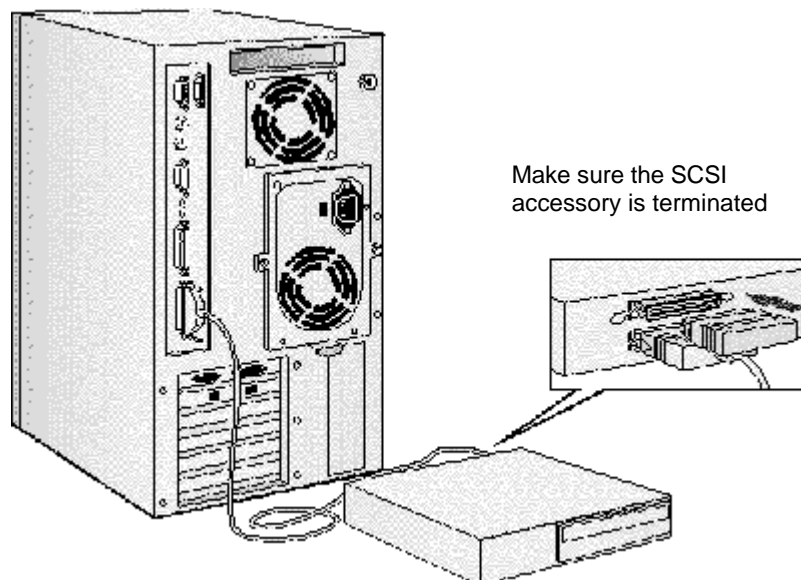
4   Refer to the manual provided with the SCSI accessory to learn how to install any software that may be necessary to use it.

NOTE	The total length of the external SCSI cables should not exceed 3 meters (approximately 10 feet).
	Contact your dealer to order shielded HP SCSI cables to connect external SCSI accessories.

CONNECTING THE POWER CORDS

1   If fitted, remove the warning label covering the computer's power connector on the rear of the computer.

2   Check that the voltage selection switch has been correctly configured for your country.

If the voltage selection is incorrect for your country, select the correct voltage 115V or 230V
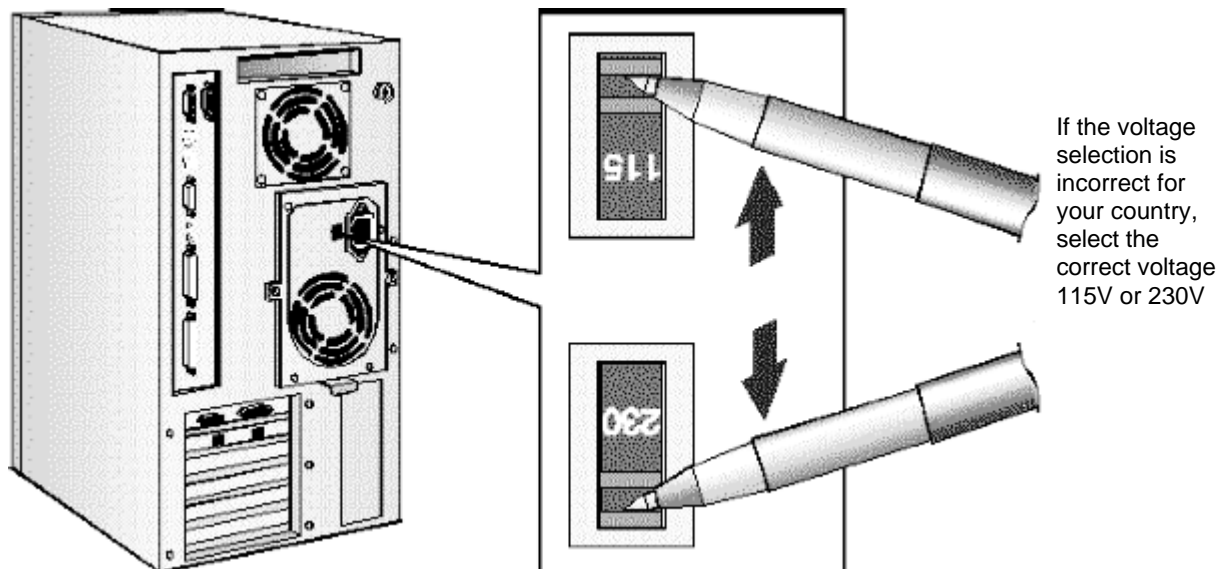
NOTE	You should not have to change the voltage selection switch setting if the computer was ordered from HP with the correct localization option for your country.

3   Connect the power cords to the display and the computer. (The connectors are shaped to go in one way only.)

Computer Power
Connector

Grounded Outlet

Display Power Connector
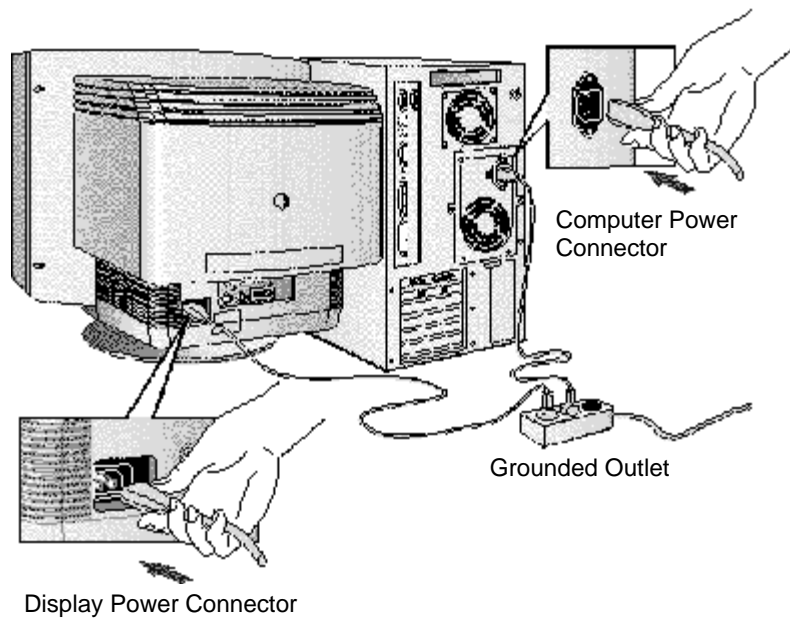
4   Connect the display's power cord and the computer's power cord to grounded outlets.

WARNING: **For your safety, always connect the equipment to a grounded wall outlet. Always use a power cord with a properly grounded plug, such as the one provided with this equipment, or one in compliance with your national regulations.**

This PC is disconnected from the power by removing the power cord from the power outlet. This means the PC must be located close to a power outlet that is easily accessible.

STARTING AND STOPPING YOUR PC

Starting Your PC

1   Press the power button on the display.
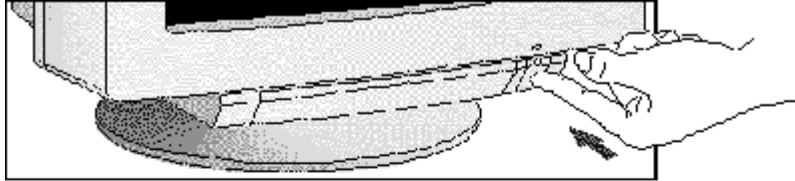
Switch on the display
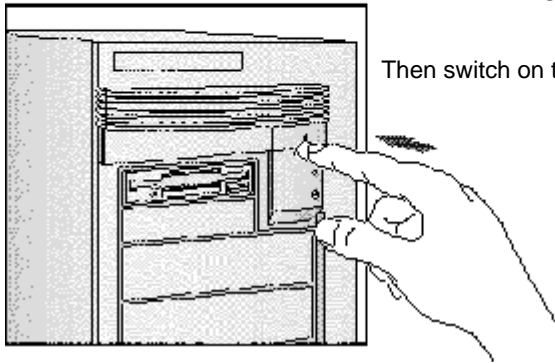
Then switch on the PC

2   Press the power button on the PC.

The PC performs a power-on self-test. If an error is detected, a message is displayed. Follow the instructions provided to correct the error.

NOTE	If the space bar on your keyboard has a power-on icon, you can start the PC by pressing the space bar. (This feature can be enabled or disabled with the Setup program — see chapter 4 for more information about the Setup program.)
	Note that you cannot stop your PC by pressing the space bar.

3   If a Password has been set in the PC's Setup program, the power-on prompt appears when you switch on the PC. If the power-on prompt is displayed, type your Password and press [ENTER] to use the PC.

Correct password   Wrong password

Restart the PC, then
enter your password
again
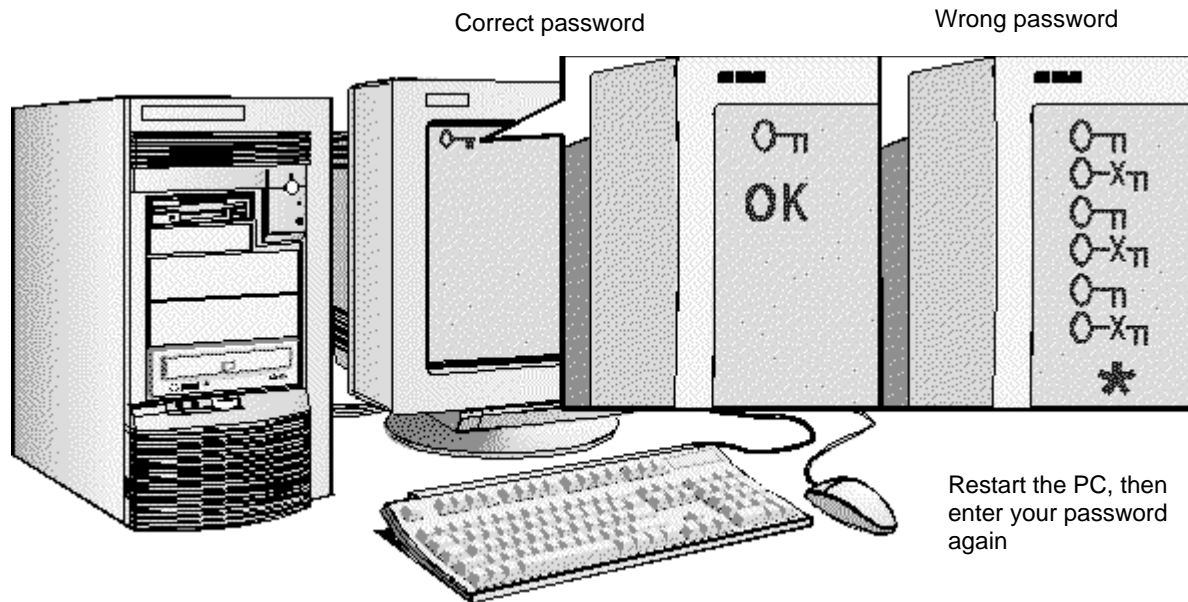
4   When your PC has started:

•   Adjust the display screen's brightness and contrast to your needs. If the picture does
     not fill the screen or is not centered refer to the display's manual for instructions.

•   Set the keyboard to a comfortable position.

Adjust brightness

(your display may be different
from the display shown here)
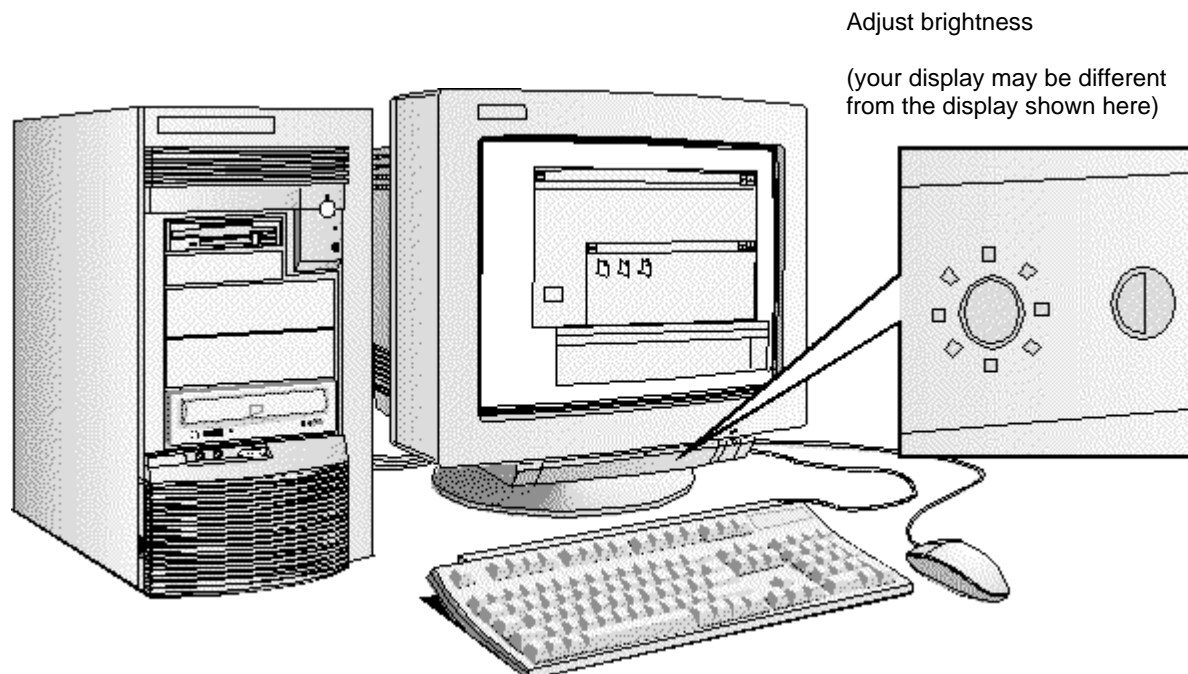
Stopping Your PC

1   To stop your PC, make sure that you have exited all programs then shutdown your operating system (refer to your operating system reference guide for details if you are not sure how to shutdown your operating system).

2   Press the power button to stop your PC.

NOTE	If Windows 95 is installed, select Shutdown from the Start menu and the PC will power off. It is not necessary to press the power button.

Resetting Your PC

The Reset button lets you restart the PC without switching the PC off and then on again. Make sure that you have exited all programs then shutdown your operating system before you press the reset button.

You may need to push hard on the reset button
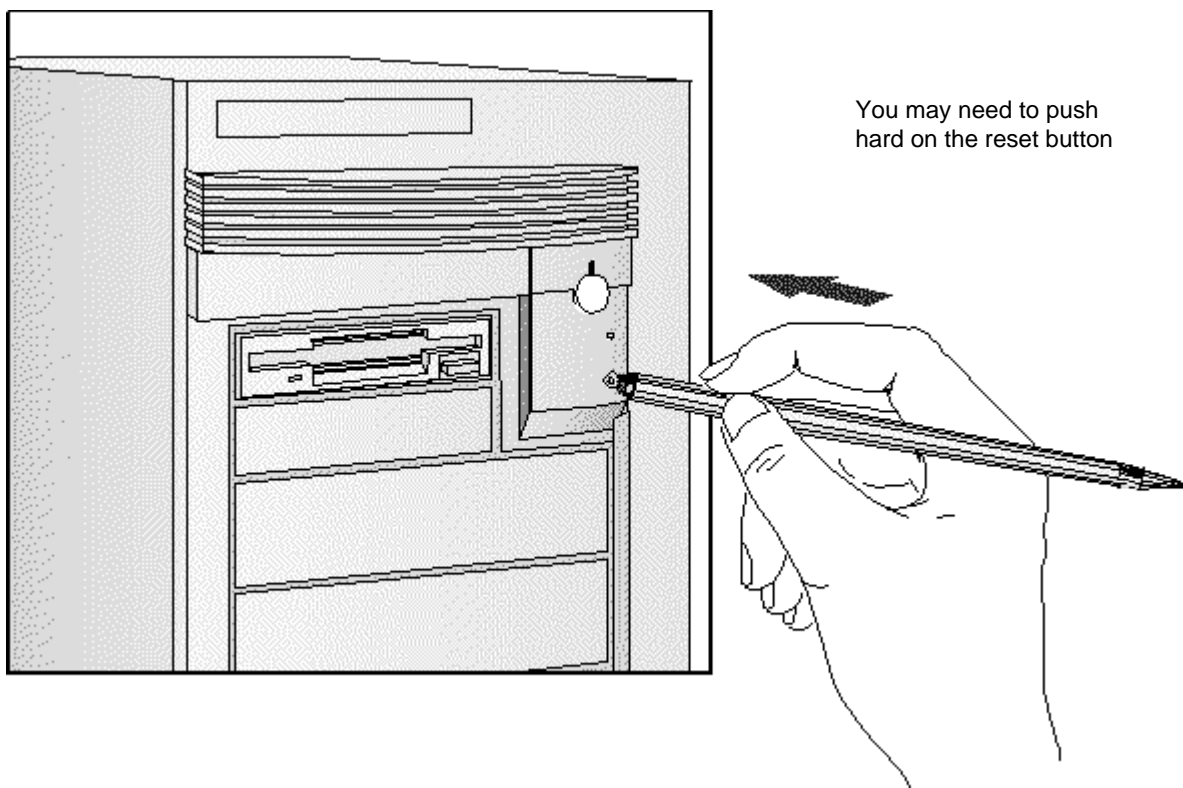
INSTALLING AN OPERATING SYSTEM

This section provides information on installing the Windows NT Workstation operating system, OS/2 Warp Connect, and Windows 95 on your HP Vectra. For detailed installation information, refer to the manual that came with your operating system.

INSTALLING THE WINDOWS NT WORKSTATION OPERATING SYSTEM

The following instructions describe a simple installation of the US English version of the Windows NT Workstation operating system on a Vectra PC with a SCSI hard disk. For complete installation information, consult the manual that came with the operating system.

Preparing to Install Windows NT

Your PC is supplied with a disk kit, comprising one "XU/VT Boot" diskette and one "XU/VT Drivers and Documentation" CD-ROM disk. You will need to copy some important files (system drivers) from the CD-ROM to a blank diskette, before attempting to install Windows NT.

To copy the files from the CD-ROM:

1   Use the MS-DOS **DISKCOPY** command to make a *duplicate* copy of the "XU/VT Boot" diskette onto the blank diskette, then store the original "XU/VT Boot" diskette in a safe place.

2   Label the duplicate diskette: "XU/VT Boot" diskette.

3   Insert the duplicate "XU/VT Boot" diskette in the flexible disk drive and insert the "XU/VT Drivers and Documentation" CD-ROM disk in the CD-ROM drive.

4   Restart your PC and press [F2] to enter the Setup program.

5   Highlight **Operating System** and select **Windows NT**. Press the [F3] key to save the setting and exit the Setup program.

6   When your PC restarts, it will start (boot) from the inserted diskette. Follow the displayed instructions to copy the files needed for an installation of Windows NT.

7   Remove the disks from your computer when the files have been copied from the CD-ROM disk to the duplicate diskette.

Installation Procedure

Before installing Windows NT, make sure you have these disks:

•   Windows NT Setup disks
     (Setup Boot disk, Setup disk #2, and Setup disk #3)
•   Windows NT CD-ROM
•   the *duplicate* "XU/VT Boot" diskette.

1   Insert the Windows NT "Setup Boot Disk" into drive A and insert the Windows NT CD-ROM in the CD-ROM drive. Restart your PC.

2   Insert "Setup Disk #2" when prompted by the installation program.

3   Press [ENTER] to setup Windows NT.

4   Press [ENTER] to select the **Express Setup**.

NOTE	If you are installing the US English version of Windows NT with a localized (non-US English) keyboard, you should choose the Custom Setup. The Custom Setup gives the option of selecting a localized keyboard.

5   Insert "Setup Disk #3" when prompted by the installation program.

6   When the installation program reports that no mass storage devices have been found, press **S** to specify an additional device.

7   Select **Other** by pressing [ENTER]. Remove "Setup Disk #3", insert the duplicate "XU/VT Boot" diskette, and then press [ENTER].

8   Press [ENTER] to select the displayed Adaptec driver and then press [ENTER] to continue the installation.

9   Insert "Setup Disk #3" when prompted by the installation program.

10   Press [ENTER] to install Windows NT from the CD-ROM.

11   Follow the instructions displayed by the installation program. When asked to insert the Adaptec driver diskette, insert the *duplicate* "XU/VT Boot" diskette and press [ENTER] to retry.

12   When the files have been copied from the duplicate "XU/VT Boot" diskette, remove the diskette and press [ENTER] to restart your computer.

13   Follow the instructions displayed by the Windows NT installation program to continue the installation of Windows NT.

14   When the installation program tries to detect the network adapter, click **Continue**, then select **Continue** in the next dialog box.

15   Select **No Network** in the **Add Network Adapter** dialog box, then click **OK** to confirm your choice. (The installation of network drivers is explained in the following section.)

16   Continue the Windows NT installation until a dialog box proposes the type of display connected to your computer.

17   Click **OK** to select the **VGA Compatible Display**, then click **OK** to save the configuration.

18   When the installation of Windows NT is complete, click **Restart Computer** to restart your computer.

Enabling Networking After Installation

To enable networking, start Windows NT and follow these steps:

1   In the Control Panel, choose the **Network** icon.

2   Click **Yes** when the **Install Network Now** message appears.

3   Confirm (or change) the proposed setup path, which is the source of the Windows NT installation files on the Windows NT CD-ROM (for example, **D:\i386**).

4   Click **Continue** to install the HP network driver for Windows NT. To install the driver:

   a   Choose **Do Not Detect** to manually select an adapter.

   b   Click **Continue** to choose a network adapter.

   c   In the list box, choose **Other** and then select **Continue**.

   d   Insert the duplicate "XU/VT Boot" diskette and specify the location of the drivers with **A:\LAN**.

   e   Choose the displayed HP 10/100VG network adapter.

5   The system will continue with the installation. Follow the instructions displayed by Windows NT to complete the network driver installation process.

6   When prompted by the installation program, click on **Restart Computer**.

Changing the Video Driver after Installation

Windows NT starts in VGA mode by default. To install the latest HP qualified video driver for Windows NT:

1   In the Control Panel, choose the **Display** icon.

2   Choose **Change Display Type**.

3   Click **Change**.

4   To install the HP video driver:

   a   Choose **Other**.

   b   Insert the *duplicate* "XU/VT Boot" diskette and specify the location of the drivers with **A:\VIDEO**.

   c   Choose your desired resolution from the list of Matrox MGA Millennium drivers and click **Install**.

   d   When asked to confirm the location of the drivers, verify that **A:\VIDEO** is displayed then click **Continue**.

   e   When the files have been copied from the *duplicate* "XU/VT Boot" diskette, follow the displayed instructions to restart the computer.

Enabling the integrated Audio Interface after Installation

To enable the integrated audio interface:

1   In the Control Panel, choose the **Drivers** icon.

2   Click on **Add**.

3   **Remove** the highlighted adapter.

4   Click **Add**.

5   Choose **Creative Labs Sound Blaster 1.x, Pro, 16** from the list and click **OK**.

6   Confirm the proposed settings in the following dialog box, then click **OK**.

NOTE	The proposed settings will correspond, by default, with the Audio Interface settings in the HP Setup program. If an error message appears, check that the proposed settings are the same as those configured in the Setup program. Refer to chapter 4 for more information about the Setup program.

Changing the SCSI Driver after Installation

To install the latest HP qualified SCSI driver for Windows NT:

1   Click the **Windows NT Setup** icon.

2   In the **Options** menu, choose **Add/Remove SCSI Adapters**.

3   Click on **Remove**, to remove the highlighted adapter.

4   Click **Add**, to add a new adapter.

5   Choose **Other** from the list box.

6   Insert the *duplicate* "XU/VT Boot" diskette (or a diskette containing the latest qualified SCSI driver) and specify the location of the driver, for example **A:\SCSI**.

7   When the name of the new Adaptec SCSI driver is displayed, click OK to select it.

8   Choose **Install**, then click **New**.

9   After the installation, follow the instructions displayed by Windows NT to restart the computer.

INSTALLING THE OS/2® OPERATING SYSTEM

These instructions explain how to install OS/2 Warp Connect on a HP Vectra PC with a SCSI hard disk. For complete installation information, consult the manual that came with the operating system diskettes.

Before installing OS/2 Warp, make sure you have these disks:

•   OS/2 Warp installation disks
•   "XU/VT Drivers and Documentation" CD-ROM.

Preparing to Install OS/2 Warp

1   Start your PC and press [F2] to enter the Setup program.

2   Highlight **Operating System** and select **IBM OS/2**. Press the [F3] key to save the setting and exit the Setup program.

Installation Procedure

Consult the manual that came with your OS/2 Warp installation disks for a detailed explanation of the installation procedure.

When the installation program prompts you to install networking support, select **No**. Networking support should be installed after completing the installation of OS/2 Warp.

When the installation of OS/2 Warp has completed, two error messages will appear when your computer is restarted:

```
SYS1201: The device driver C:\MMOS2\SB16D2.SYS... was not
installed

SYS1201: The device driver C:\MMOS2\AUDIOVDD.SYS... was not
installed
```

Press [ENTER] to continue when each error message appears. (These messages will appear because the HP SCSI drivers have not yet been installed. You must install the HP SCSI drivers, as described below, to prevent this error message appearing again.)

Installing the HP SCSI Drivers

To install the latest HP qualified SCSI driver for OS/2:

1   Insert the "XU/VT Drivers and Documentation" CD-ROM into the CD-ROM drive.

2   Open the OS/2 **System** folder, then the **System Setup** folder.

3   Click on the **Device Driver Install** icon.

4   Change the source directory for the drivers with the **Change** button to **D:\SCSI\OS2**.

5   Click the **Install** button. The drivers will be copied from the CD-ROM.

6   Exit from the OS/2 Device Driver installation.

7   Shutdown OS/2, then restart your computer to use the new SCSI drivers.

Installing the HP Network Drivers

To install networking support with the latest HP qualified network drivers for OS/2:

1   Insert the "XU/VT Drivers and Documentation" CD-ROM into the CD-ROM drive.

2   Open the OS/2 System folder, then open the **OS/2 Warp Connect Install/Remove** folder.

3   Click on **Warp Connect Selective Install for Networking**.

4   Select an installation on this workstation (local install).

5   Follow the instructions displayed by the installation program.

6   Click on the **Other Adapter** button, when the **Select Network Adapter** dialog box appears.

7   Enter **D:\LAN\IBM\OS2**, when asked for the file location, and click **OK**.

8   The **HP PCI Integrated 10/100VG Interface** will be displayed in the **Drivers Found** dialog box. Select **Ethernet** as the **Type of LAN**.

9   When the **Select Network Adapter** dialog box appears, the **HP PCI Integrated 10/100VG Interface** is highlighted in the adapter list.

10   Remove the "XU/VT Drivers and Documentation" CD-ROM from the CD-ROM drive, insert the OS/2 Warp Connect CD-ROM and then click **OK**.

11   Click **OK** in the **Select Network Adapter** dialog box, to accept the selection of the adapter.

12   Click **OK**, then click **OK** again in the configuration dialog box.

13   Click the Install button in the **Ready to Install** window.

14   Select **OK** to confirm the shutdown of the operating system. Leave the OS/2 Warp Connect CD-ROM in the drive (some files will be copied from the CD-ROM when the operating system restarts).

Installing the HP Video Driver

After successful installation of OS/2, you should install the HP video driver from the "XU/VT Drivers and Documentation" CD-ROM.

1   Insert the "XU/VT Drivers and Documentation" CD-ROM in the CD-ROM drive.

2   In the OS/2 **System** folder, open the **Command Prompts** folder and click on the OS/2 **Full Screen** icon.

3   At the command prompt, type the following:

```
D: [ENTER]
CD VIDEO\DISK5 [ENTER]
INSTALL /U [ENTER]
```

This will start an 'unattended' installation of the video drivers.

4   When the installation of the drivers has completed, exit from the command prompt, shutdown the operating system, then restart the system.

Selecting a Display

1   In the OS/2 System folder, open the Command Prompts folder and click on the OS/2 Full Screen icon.

2   At the command prompt, type the following:

```
CD \MGA\OS2 [ENTER]
MGAMON [ENTER]
```

This will start the MGA Display selection program. Choose your display (monitor) from the list.

3   When this selection process has completed, exit from the command prompt, shutdown the operating system, then restart the system.

Changing Display Settings

1   In the OS/2 **System** folder, open the **System Setup** folder.

2   Click on the **System** icon and change the settings (for example, the screen resolution).

INSTALLING WINDOWS 95

These instructions explain how to install the US English version of Windows 95 (for PCs without Windows) on a HP Vectra PC with a SCSI hard disk. For complete Windows 95 installation information, consult the manual that came with your Windows 95 diskettes.

Preparing to Install Windows 95

Your PC is supplied with a disk kit, comprising one "XU/VT Boot" diskette and one "XU/VT Drivers and Documentation" CD-ROM disk. Before attempting to install Windows 95 you should make a duplicate copy of the "XU/VT Boot" diskette onto a blank diskette:

1   Use the MS-DOS **DISKCOPY** command to make a *duplicate* copy of the "XU/VT Boot" diskette onto a blank diskette, then store the original "XU/VT Boot" diskette in a safe place.

2   Label the *duplicate* diskette: "XU/VT Boot" diskette.

3   Restart your PC and press [F2] to enter the Setup program.

4   Highlight **Operating System** and select **Windows 95**. Press the [F3] key to save the setting and exit the Setup program.

Installation Procedure

Install Windows 95 from the Windows 95 (for PCs without Windows) installation disks, following the instructions in the manual supplied with the Windows 95 diskettes.

1   When Windows 95 is installed, shutdown the PC by selecting **Shutdown** from the **Start** menu.

2   Switch off the PC.

3   Insert the *duplicate* "XU/VT Boot" diskette in the flexible disk drive and insert the "XU/VT Drivers and Documentation" CD-ROM in the CD-ROM drive.

4   Switch on the PC.

5   Select the Windows 95 Diskette Kit option from the menu. This option copies the SCSI drivers from the "XU/VT Drivers and Documentation" CD-ROM to the hard disk.

6   When the files have been copied, remove the diskette and the CD-ROM, then restart your PC.

7   To install the SCSI drivers after restarting your PC, click on the Start button then:

    point to **Settings**,
    click on **Control Panel**,
    double-click on **System**,
    and click on the **Device Manager** tab.

8   Double-click on **Other Device** then double-click on **PCI SCSI Bus Controller**.

9   Click on the **Driver** tab and then click on the **Change Driver** button.

10   Click on **Other Devices**, then click on **OK**. Confirm the selection of the **Adaptec AIC-7880 PCI SCSI Controller** by clicking on **OK**.

11   Click on **OK** then click on **OK** again. Click on **Cancel** when the **Test** button appears.

12   Windows 95 will build a new driver database and install the new SCSI drivers. Restart the PC to activate the SCSI drivers.

Installing the MGA Video Driver

1   Insert the "XU/VT Drivers and Documentation CD-ROM" in the CD-ROM drive.

2   Double-click on the **My Computer** icon on the Windows 95 desktop.

3   Double-click on the CD-ROM drive icon, then on the Video folder, then on the folder named Disk 6.

4   Execute the file named Setup (to start the MGA Millennium PowerDesk Setup).

5   Click on the **Next** button to accept the default destination path.

6   Click on the **Next** button to confirm the installation of **Quick Access** and the **MGA Monitor Program**.

7   Click **OK** in the Information . . . window.

8   Click **OK** in the next dialog box, when asked to use the Windows 95 monitor mechanism.

9   Click **OK** when a message explains that the driver has been installed.

10   Click on the **Start** button of the **MGA Change Display Wizard**.

11   Click on the **Settings** tab in the **Display Properties** folder.

12   Click on **Change Display Type**.

13   Click on **Change of the Adapter** Type (the adapter will be incorrectly detected as "Oak Technology Super VGA").

14   Click on **Have Disk**.

15   Enter `D:\VIDEO\DISK6` as the path to copy the files from.

16 Click on **OK** to confirm **MGA Millennium Power Desk**. (The files will be copied from the CD-ROM to the hard disk.)

17 Click **Close** in the **Change Display Type** folder.

18 Click Finish on the **MGA Change Display Wizard**.

19 Click **Yes** to restart in the **MGA Exit Wizard** dialog box. Windows 95 will restart with the new video drivers.

Configuring the Display

1 Click on the **Start** button then:
      point to **Programs**,
      click on **MGA Millennium Power Desk**,
      and double-click on **MGA Monitor Program**.

2 Click on the **Selection** button, select your display, then confirm your selection with **OK**.

3 Click on **Save and Exit**, then select **Restart** to restart Windows 95.

Changing Display Settings

1 Click on the **Start** button then:
      point to **Settings**,
      click on **Control Panel**,
      and double-click on **Display**.

2 Click on the **MGA Settings** tab to change display settings.

Configuring the Network

1 Click on the **Start** button then:
      point to **Settings**,
      click on **Control Panel**,
      and double-click on the **Network** icon.

2 Click on the **Add** button and, in the **Select Network Component Type** window, choose **Adapter** then click on the **Add** button.

3 Click on the **Have Disk** button, then insert the "XU/VT Drivers and Documentation" CD-ROM in the CD-ROM drive.

4 In the **Install from Disk** window, specify the path for the files on the CD-ROM with **D:\LAN\W95**.

5 Click **OK** to confirm the selection of the **HP PCI Integrated 10/100VG Interface**.

6 Restart the PC, by selecting **Shutdown** from the **Start** menu.

2   USING YOUR PC

This chapter gives important ergonomic advice, explains how to set a password, and shows how to use your CD-ROM drive.

WORKING IN COMFORT

Thank you for choosing Hewlett-Packard equipment. To maximize your comfort and productivity it is important that you set up and use your equipment properly. This section of the *User's Guide* provides guidance and hints, based on the latest ergonomic findings, to help you work in a comfortable and ergonomically low-risk environment. Also, international regulations and guidelines are included from the European Community Display Screen Equipment directive and ISO 9241 to ensure that the information presented is applicable worldwide. Please be aware that the quoted dimensions are for an average person. They may need to be adjusted to your individual physical characteristics. For example: if you are an extra tall person, your work surface may need to be higher than the range listed. Prior to using any Hewlett-Packard equipment, study these instructions and suggestions and consult the bibliography at the end of this section. If, during use of this or any other equipment, you experience pain or discomfort, stop work and review this section of the *User's Guide*. Should the discomfort return, discontinue use of the equipment and consult a doctor as soon as possible.

REPETITIVE STRAIN INJURY

Because your safety and comfort is our primary concern, we strongly recommend that our equipment be used in accordance with ergonomic standards and recommendations. Recent literature suggests that there may be a relationship between injury to soft tissues, especially in the hands and arms, and the prolonged use of keyboards or other equipment requiring repeated motions of the hands and forearms. Literature also suggests that there are many other risk factors which may increase the chance of such soft-tissue injury, commonly called Repetitive Strain Injury.

QUESTIONS AND ANSWERS

What is RSI?

Repetitive Strain Injury (RSI - also known as cumulative trauma disorder or repetitive motion injury) is a type of injury where soft tissue in the body, such as muscles, nerves, or tendons, become irritated or inflamed. In an extreme case, this irritation can lead to permanent tissue damage. RSI has been a reported problem for workers performing specific tasks such as assembly line work, meat packing, sewing, playing musical instruments, and VDT work. It may also result from other activities such as carpentry, knitting, housework, gardening, tennis, wind surfing, and lifting children.

Why is it important for me to exercise care in how I set up and use my equipment?

Some people who use VDTs experience physical discomfort during their use. Sometimes this discomfort leads to a repetitive strain injury. Setting up and using equipment properly can help to minimize this discomfort. Use your equipment in an appropriate way. Well-designed and adjusted equipment may not be sufficient to eliminate all potential problems. How you perform your VDT activities is also important.

What causes RSI?

RSI is caused by any demanding activity that exceeds the ability of the body to do work. Common factors that are associated with RSI include too many uninterrupted repetitions of an activity or motion, performing an activity in an awkward or unnatural posture, maintaining static posture for prolonged periods, failing to take frequent short breaks, and stress. Also, certain medical conditions such as rheumatoid arthritis and diabetes may contribute to RSI.

What should I do if I start to experience RSI symptoms or discomfort?

By following the guidance on proper equipment and work environment set up and use, the risk of developing RSI can be minimized. However, if you are experiencing any discomfort, seek professional medical advice immediately. Typically, the earlier a problem is diagnosed and treated, the easier it may be to resolve.

INSTALLING YOUR DISPLAY

Most HP displays come with a tilt and swivel feature that makes it easy to adjust the screen position. If your display does not have this feature, consider acquiring an accessory to provide this capability. The optimum distance between the eyes and the screen depends on the size of the displayed characters.

- Optimum readability is generally considered to be 21 minutes of arc. This corresponds to a character size of 3.7 mm (0.15 in) at a viewing distance of 60 cm (24 in).

- If your eyes are closer to the screen than 50 cm (20 in) undue stress may occur: Most people prefer a viewing distance of approximately 60 cm (24 in).

- The maximum viewing distance is usually limited by the character size and the available space on the desk top.

The top of your display screen should be at or slightly below eye level. This will keep you from looking down more than 15 to 20 degrees to see the center of the screen. You should not have to look down more than 60 degrees for normal work tasks, such as typing or reading.

Ideally the screen should be positioned perpendicular to your line of sight. In case of undesirable reflections, tilting the screen forward slightly usually solves the problem. However, if this is not sufficient, it may be necessary to change the position of the display on the desk, or change the location of the desk.

If this still does not correct the problem, try a good quality anti-glare filter, or a screen hood.

Keep the contrast and brightness adjusted to the level that is most comfortable for you. High contrast and low brightness is usually the preferable combination. Since buildup of screen dirt is gradual and therefore often overlooked, don't forget to clean the screen on a regular basis.

WHAT IS DISPLAYED ON THE SCREEN

Text should be easy to read. To help ease eye strain, try to adjust text attributes to make reading the display as easy as possible (adjust such attributes as character size, spacing, and color).

NOTE	The ISO 9241 and ANSI/HFS 100-1988 standards give ample technical recommendations on how to achieve good readability.

If the image on your screen is not stable, the display may require repair or adjustment.

When possible, use a program that has a simple "machine/user interface". Also, screen information should be displayed in a structured and well organized way.

USING A DOCUMENT HOLDER

A document holder may make it easier to transfer information from a document to the screen (or if you need to read while using your system).

If using a document holder, it should be at the same distance from your eyes as the screen, next to the screen, and at the same height as the screen. An alternative location preferred by some people is to locate the document holder between the screen and keyboard.

To help reduce stress on your neck and prevent eye fatigue, keep the back and forth movement of your head and eyes to a minimum while using a document holder.

YOUR HP KEYBOARD

Your HP keyboard has a long cable so you can place it in the position most comfortable for you while you are using the system.

The keyboard has a low profile to prevent excessive bending of your wrists while typing. Literature suggests that you should not bend your wrists more than 10 degrees up or down, or more than 10 degrees sideways. Keep your wrists straight by moving your entire hand and forearm over to use the function keys or numeric keypad.
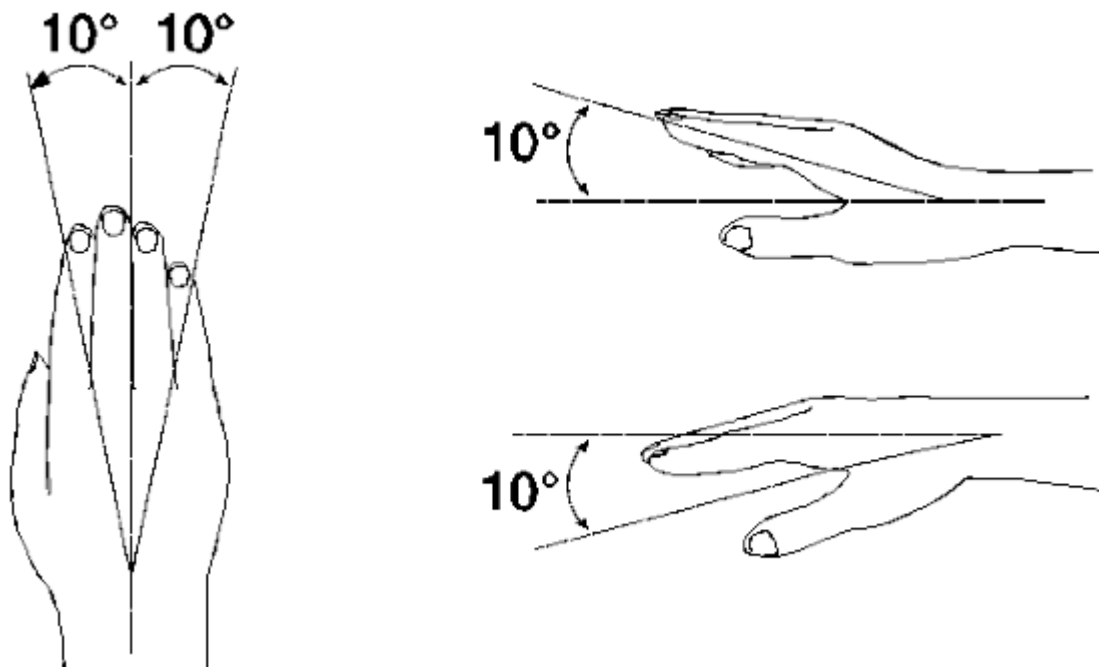
Your HP keyboard may have a kickstand which can be opened or closed to raise or lower the keyboard angle. If your elbows are at about the same level as the work surface, then you may choose not to use the kickstand. If your elbows are below the work surface, you may wish to raise the back of the keyboard by using the kickstand. The point is to make sure that your hands are in a "neutral" or flat position when you use the keyboard. This means that your forearms, wrists, and hands should be in straight line.

You may use a wrist rest to help keep your wrists in a more comfortable and neutral position. If you use a wrist rest, ensure that it is flush in height with the front edge of the keyboard, and rounded or padded. Try not to rest your wrists on a sharp edge, such as a desk edge, when typing.

It is recommended that you place your keyboard in front of the screen or document holder (whichever is viewed the most).

If you use a mouse or trackball, position it close to the keyboard so you do not have to stretch while using it.

It is not necessary to type with very much force. Use of too much force can place unnecessary stress on your body, including tendons and muscles in your hands, wrists, and forearms, and increase risk of discomfort or injury.

YOUR DESK

Sufficient desk space should be available to allow you to set up your equipment in a convenient, comfortable arrangement. Recommended workstation desk space is 160 by 80 by 90 cm (63 by 32 to 36 inches). Depending on the nature of your work, you may need a smaller or larger work surface.

To minimize reflections and glare (and thus eye discomfort), the surface of the desk should be non-reflective (matt).

Ideally, the work top height should be adjustable. Recommended range is 66 to 77 cm (26 to 30 inches). If the desk top height is fixed, it should be between 72 and 75 cm (28.5 to 29.5 inches).

There should be at least 6 cm (2 inches) of space between your thighs and the desk top. If the desk has a "kneehole" it should be at least 58 cm (23 in) wide, 65 cm (25.5 in) high, and 60 cm (24 in) deep.

If possible, choose a desk with cable management capabilities. This will keep your cables and wires orderly, off the floor, and out of the way.

YOUR CHAIR

Your chair should have a stable base (for example: five legs with casters). It is important that the casters be matched to the type of floor in your workspace (that is, hard surface or carpet).

The chair must provide a comfortable sitting position.

- You should be able to easily adjust the height. Minimum range should be 40 to 52 cm (15.5 to 20.5 in) as measured from the floor.

- It should have a back support that is adjustable in both height and tilt (0 to 30 degrees backwards). It is important that your lower back be correctly supported (lumbar curve of the back).

- You should be able to freely swivel from side to side.

- The front of the seat should be curved ("waterfall" edge), and the chair fabric should be breathable.

If your chair has armrests, they should be fully adjustable. The arms should not interfere with adjusting the chair or moving it close to the desk.

Adjust the chair so that the work surface is at elbow height.

If the chair has an adjustable seat pan, inclining the seat slightly forward will transfer some of the pressure from the spine to the thighs and feet. This will relieve spine fatigue.

Use a chair with an adjustable lumbar (back) support, which can be moved up and down. Adjust the back of the chair so that the part that curves outward (toward the front of the chair) corresponds to the part of your lower back that curves inward. (Portable lumbar cushions are also available at medical and office supply houses.)

Adjust the angle of the back rest and seat tilt so that your back is erect or angled slightly backward (90 to 110 degrees)

Some people feel more comfortable up to a 135 degree angle.

90-110°

YOUR POSTURE

While sitting at your workstation, your back should be erect or angled slightly backwards. Your back should be supported by the backrest.

Your arms should be relaxed and loose, elbows close to your sides, with the forearms and hands approximately parallel with the floor.

Your wrists should be as straight as possible while using the keyboard, mouse, or trackball. They should not have to be bent upward, downward, or to either side more than 10 degrees.

Your thighs should be horizontal or bent slightly downward. Your lower legs should be near a right angle to your thighs. Your feet should rest comfortably on the floor (flat). If necessary, use a footrest to get into a comfortable position.

Your head should be upright or tilted slightly forward (but not more than 15 degrees).

Avoid working with your head or trunk twisted in an unnatural position.

Change your position frequently to avoid fatigue.

YOUR WORKSPACE AND WORK ENVIRONMENT

To prevent muscle stiffness, you must have enough space to move around and vary your position. Do not remain in one position for extended periods of time.

For better eye relief, the ceiling, walls, and floors should have a medium level of reflectance (approximately 75%, 40%, and 30% respectively). Try to avoid excessive contrast between the screen and its surroundings.

The work environment should be as quiet and free of distraction as possible (background noise preferably below 55 dBA).

Where possible, relative air humidity should be in the range of 40 to 60%.

The recommendation for room temperature is 19 to 23 degrees C (66 to 73 degrees F). If possible, adjust the temperature for whatever is comfortable to you.

The workplace should be well ventilated (as with any indoor environment).

LIGHTING

Lighting in your area should allow easy reading of documents and keyboard legends.

Recommended levels are:

- Not too bright. Values over 1000 lux (100 foot candles) are considered to be too bright.

- Recommended value is between 300 and 500 lux (30 to 50 foot candles).

- For work on the screen, 300 lux (30 foot candles) is enough for most work.

- When documents are to be read, 500 lux (50 foot candles) is recommended.

If more light is needed for a particular task, use an individual lamp ("task lighting") rather than increasing the general lighting.

Incoming light should be shielded or diffused to prevent glare and distracting reflection. In cases where strong sunlight is a problem, curtains, adjustable shades, or display hoods are recommended.

If possible, try not to position the display in front of windows where glare, high contrast, and reflections will interfere with your screen presentations. Try to position the display so the screen is at a right angle to the window.

FURTHER SUGGESTIONS

- Have your eyes checked on a regular basis and ensure your eyeglass prescription is suitable for working on a display screen.

- Look away from the screen from time to time to help reduce eye strain. Focus on distant objects briefly. Also, blinking periodically helps lubricate the eyes.

- Avoid holding your muscles tensed for long periods of time. Keep your fingers and body relaxed.

- Changing tasks frequently will help prevent muscle stiffness. For example: alternating between using the keyboard, writing, filing, and moving around in your work environment, helps keep muscles loose.

- When prolonged screen work is required, take frequent short breaks. As a rule of thumb, a five or ten minute break every hour is a good idea. Short frequent breaks are more beneficial than longer less frequent breaks. Data shows that people who work for long lengths of time without a break are more prone to injury.

- Occasionally stretch the muscles in your hands, arms, shoulders, neck and back. You should stretch at least as often as you take your breaks, that is, at least once per hour.

- Discomfort, if any, may be alleviated by use of alternative ergonomic designs and accessories such as: ergonomic personalized chairs, wrist rests, keyboard trays, alternative input devices, non-prescription eye glasses, glare screens, and more. Seek additional information from the sources available to you, including your employer, doctor, local office supply store, and the bibliography provided at the end of this section.

- If you experience any discomfort, discontinue use and see a doctor as soon as possible. If you want additional information on VDT setup, ergonomics and related topics, consult your employer and the sources listed at the end of this section.

SUMMARY RECOMMENDATIONS

The recommendations in the following illustrations are drawn from the latest available international ergonomic standards and recommendations, including ISO 9241 and ANSI/HFS 100-1988.

Do not tilt your head forward by more than 15 degrees, and try not to turn your head toward the side.

Place your display so that the top of the screen is at or slightly below eye level (but no more than 15 degrees).

Make sure frequently used equipment is within easy reaching distance from your body. For example, if you are primarily using the keyboard, place it directly in front of you, not to the side. If you are primarily using the mouse, place it in front of your hand or arm.

If you are using both a mouse and a keyboard, place them both at the same work surface height.

If a wrist rest is used, the height should be flush with the front edge of the keyboard.

Make sure there is sufficient room under the work surface for your legs.

0-15°

50-70 cm (20-28 In)

0-15°

Adjust your seat height, work surface or both to position the surface at approximately elbow height.

If after adjusting your chair you cannot rest your feet comfortably on the ground, use a footrest, preferably adjustable in height and angle.
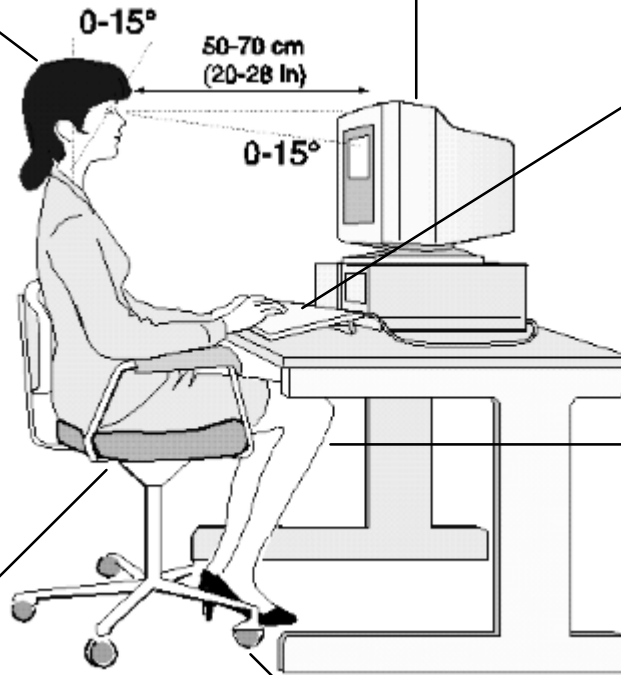
Remember to occasionally shift position and move your body. Keeping your body "locked" in one position for a long period of time is unnatural and stressful.

Make sure your arms and elbows are relaxed and loose, with your upper arm perpendicular to the floor or slightly forward (no more than 30 degrees)
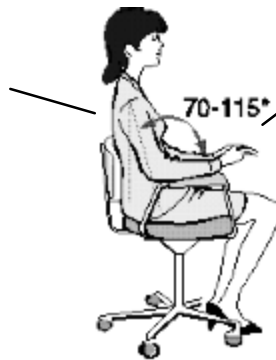
Keep your forearms and hands approximately parallel with the floor (elbows bent between 70 and 115 degrees)

70-115°

Keep your elbows close to your sides (less than 20 degrees away from your body)

20°
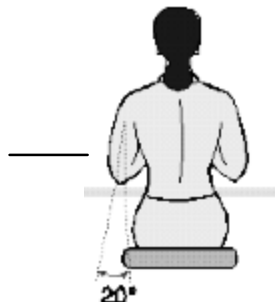
BIBLIOGRAPHY OF ARTICLES FOR MORE INFORMATION

1   Caisse Nationale d'Assurances: "Le travail a l'écran de visualisation", Lucerne (Switzerland), 1991.

2   Bayerisches Staatsministerium für Arbeit: "Arbeiten mit dem Bildschirm - aber richtig!", Max Schick GmbH, Munich, 1992.

3   U.S. Department of Labor/Occupational Safety and Health Administration: "Ergonomics: the study of work", U.S. Government Printing Office, Washington D.C., 1991.

4   International Standards Organization: "ISO 9241: Ergonomic requirements for office work with visual display terminals (VDTs)", Geneva, 1992.

5   Eric Granjean: "Ergonomics in Computerized Offices", Taylor & Francis, London, 1987.

6   European Community: "Council directive of 29 May 1990 on the minimum safety and health requirements for the work with display screen equipment", Directive 90/270/EEC, Brussels, 1990.

7   U.S. Department of Labor/Occupational Safety and Health Administration: "Working safely with video display terminals", U.S. Government Printing Office, Washington D.C., 1991.

8   Swedish National Board of Occupational Safety and Health: "Work with Visual Display Units (VDUs)", Ordinance AFS 1992:14, Stockholm, 1992.

CONFIGURING PASSWORD SECURITY

You can set two passwords, which can be used to provide two levels of protection for your PC.

User Password

The User Password provides these security features:

• a power-on password prompt to prevent your PC being started in your absence

• a keyboard lock timer which you can use to lock your PC after a specified number of minutes of keyboard inactivity

• screen blanking to conceal confidential data when the PC is locked.

System Administrator Password

Set the System Administrator Password to protect the PC's configuration in Setup. The PC can be started, but the System Administrator Password must be entered before any Setup options (except User Preferences) can be modified.

SETTING A PASSWORD

1   Turn on the PC and the display.

   If the PC is already turned on, exit all applications and then press [CTRL] [ALT] and [DELETE] to restart the PC.

2   When `<Setup=F2>` appears on the screen press
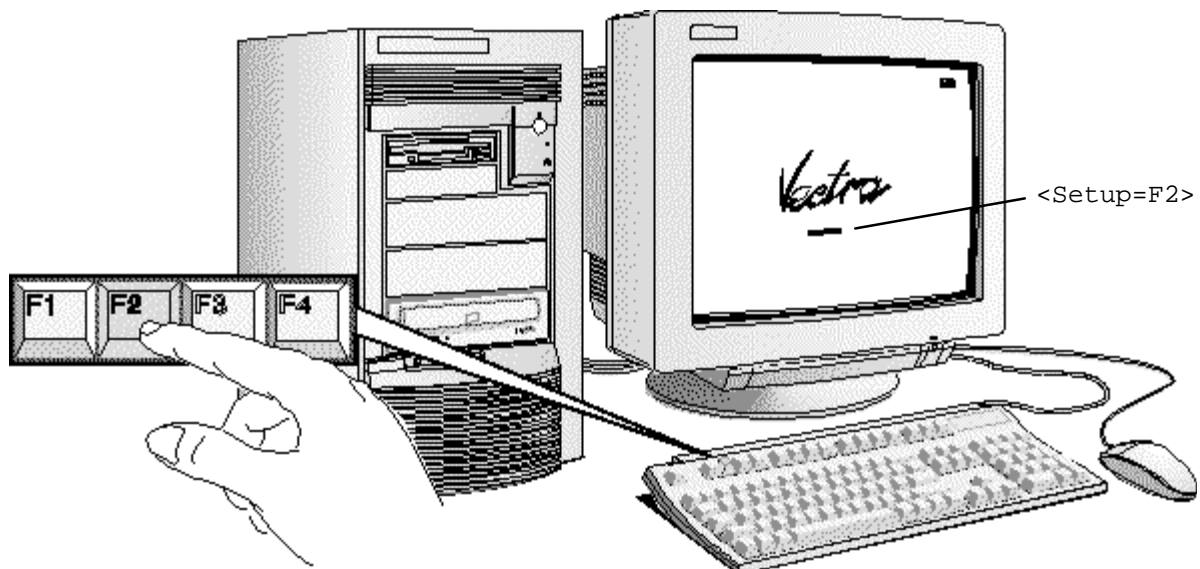
3   The PC's Setup program will appear.

```
Date (Year/Month/Day)  . . . . . . .1995 / 01 / 01
Time (Hour/Minute/Second) . . . . . 09 : 35 : 53
Windows 95  . . . . . . . . . . . . Not Installed

User Preferences
 User Password  . . . . . . . . . . Not Set
 Keyboard Lock Timer  . . . . . . . Disabled
 Screen Blanking  . . . . . . . . . Disabled
```

4   Use the ↑ or ↓ key to move the highlight to the **User Password** line.

5   To set your User Password, press [ENTER] once.

   a   Type your *password* and press [ENTER].
   b   Type your *password* and press [ENTER] again.

   The screen displays User Password . . . . Set

6   If you wish to erase your Password, press [ENTER] twice.

   If you only want to set a password, press the [F3] key now to save your password and exit
   SETUP.

NOTE	The Keyboard Lock Timer and Screen Blanking options may not be available if Windows 95 is installed on your computer.

Setting the Keyboard Lock Timer

7   Press the ↓ key until the Keyboard Lock Timer line is highlighted.

8   Press [F7] or [F8] to select a value between 1 and 75 minutes.

   If you wish to save this setting and leave SETUP, press the [F3] key now.

Setting Screen Blanking

9   Press the ↓ key until the **Screen Blanking** line is highlighted.

10   Press [F7] or [F8] to select Screen Blanking . . . Enabled.

11   Use the [F3] key to save this setting and exit SETUP.

USING YOUR CD-ROM DRIVE

Your CD-ROM drive reads information or programs on a Compact Disc (CD). It cannot record
to a CD. To learn how to access information stored on a CD, refer to the documentation
supplied with the CD.

Your CD-ROM drive may be different from the drive shown here — the Headphones Socket and Volume Control may not be present.
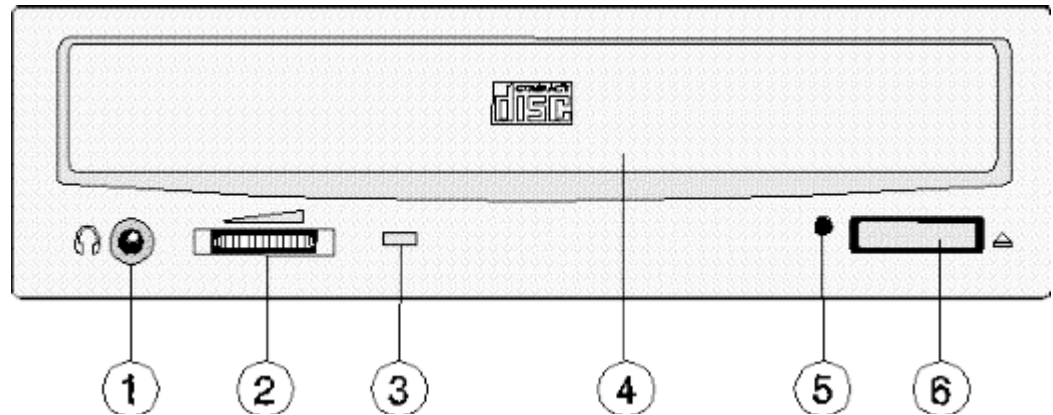
1. Open/Close Button	Opens or closes the CD-ROM drawer.
2. Emergency Eject	Used to open the CD-ROM drive mechanically when the power supply is off.
3. Door	Protects the CD-ROM drive from dust contamination and accidental damage.
4. Busy Indicator	Glows when the drive is ready and when the drive is busy.
5. Volume Control	Adjusts the volume of music played through headphones connected to the CD-ROM drive.
6. Headphones Socket	Lets you listen to music CDs by connecting headphones directly to the CD-ROM drive using a stereo mini-jack. (This does not cut out the speakers.) Adjust the volume using the Volume Control, and not using the audio software.

WARNING: **To avoid electrical shock and harm to your eyes by laser light, do not open the CD-ROM drive enclosure. The CD-ROM drive should be serviced by service personnel only.**

LOADING A CD

1   Press the Open/Close button to open the CD drawer.

2   Place the CD, label side facing up, in the recess in the drawer.
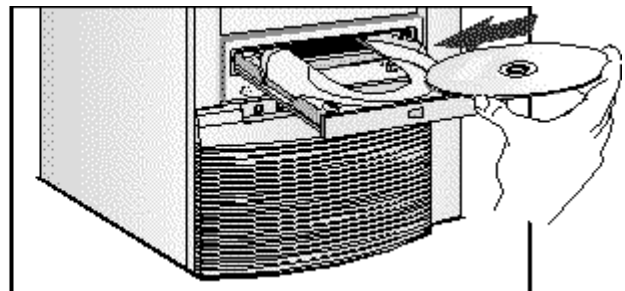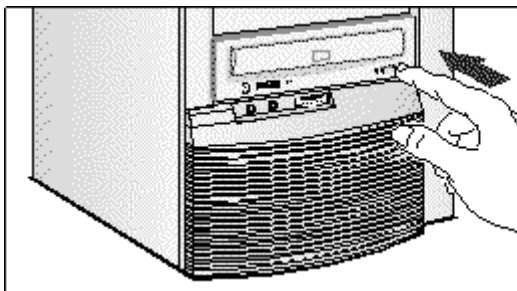
3   Press the Open/Close button to close the drawer. The drawer can also be closed by gently pushing the drawer back into the drive.

4   To remove the CD, press the Open/Close button to open the drawer. Remove the CD. Press the Open/Close button to close the drawer.

EJECTING A CD WHEN THE OPEN/CLOSE BUTTON IS DISABLED

If the Open/Close button is disabled by software or a power failure, use this procedure to remove a CD:

1   Turn off the PC.

2   Insert a straight rod (for example, a straightened paper clip) into the emergency eject hole next to the Open/Close button. The drawer should eject by about 15mm.

3   Pull out the drawer by hand until the CD can be easily removed.

4   Remove the CD.

5   Push the drawer gently back into the drive.

TIPS FOR USING YOUR PC

If you want to:	You need to:
• Install hardware accessories.	Refer to chapter 3 "How to Install Accessories Inside Your PC".
• Configure hardware accessories.	Refer to chapter 3 "How to Install Accessories Inside Your PC".
• Install new applications, and set up and use an application.	Read the manuals supplied with the application software.
• Make more disk space available.	Delete unnecessary files and increase disk space by using a disk compression program.
	Install a larger disk drive.
• Make more memory available.	Install more main memory. Refer to chapter 3.
• Display more colors.	Install more video memory. Refer to chapter 3.
• Stop anyone from starting the PC in your absence.	Run the built-in Setup program and set a Password. Refer to this chapter for details.

3 HOW TO INSTALL ACCESSORIES INSIDE YOUR PC

This chapter explains how to install accessories, such as extra memory, accessory boards, and additional disk drives, in your PC.

SUPPORTED HP ACCESSORIES

This chapter describes how to install memory, mass storage devices, and accessory boards in your computer.

Main Memory Upgrades (ECC, 60 ns)
16 MB (2 X 8 MB), order D3553A
32 MB (2 X 16 MB), order D3555A
64 MB (2 X 32 MB), order D3554A

Internal Mass
Storage Devices

Front Access Drives, for example:
3.5 inch 1.44 MB flexible disk drive
(one third height), order D2035B
5.25 inch 1.2 MB flexible disk drive
(half height), order D2881B

Mounting Trays:
3.5 inch disk drive trays,
5 pack, order D2037A

Rails for Front Access
Devices:
5.25 inch disk drive rails,
order D2880A
3.5 inch disk drive rails,
order D3566A

Contact your dealer for an up-to-date list of supported devices.

Up to six accessory
boards can be installed:
 three 32-bit PCI slots
 two 16-bit ISA slots
 one combination ISA
 or PCI slot
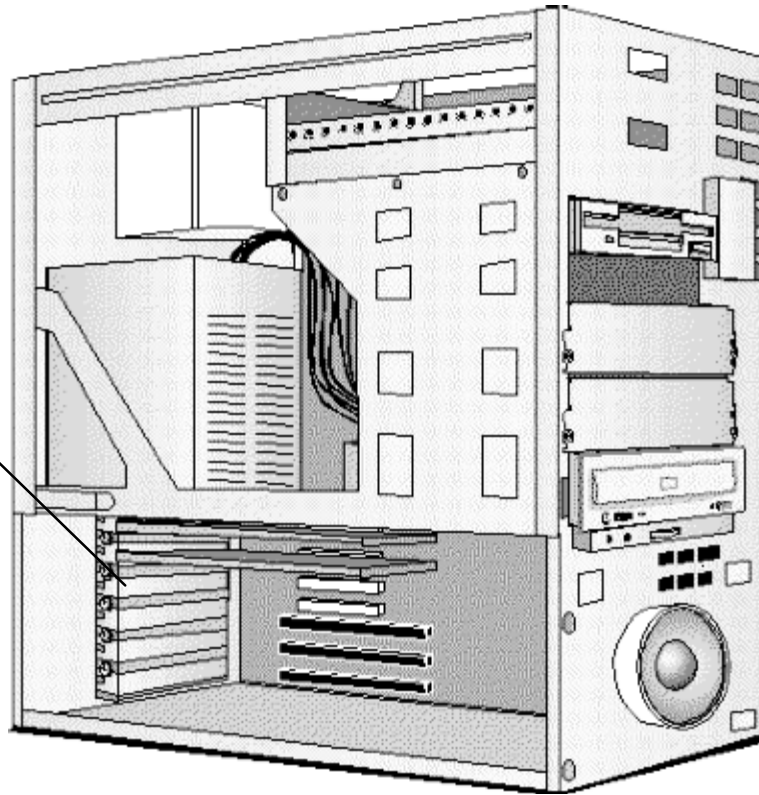
WARNING:	**For your safety, never remove the computer's cover without first removing the power cord and any connection to a telecommunications network. Always replace the cover before switching on the computer.**

REMOVING AND REPLACING THE COVER

1   Switch off the display and computer.

2   Disconnect the power cords from the power outlets, computer, and display. Disconnect any telecommunication cables from the computer.

Disconnect the power cords
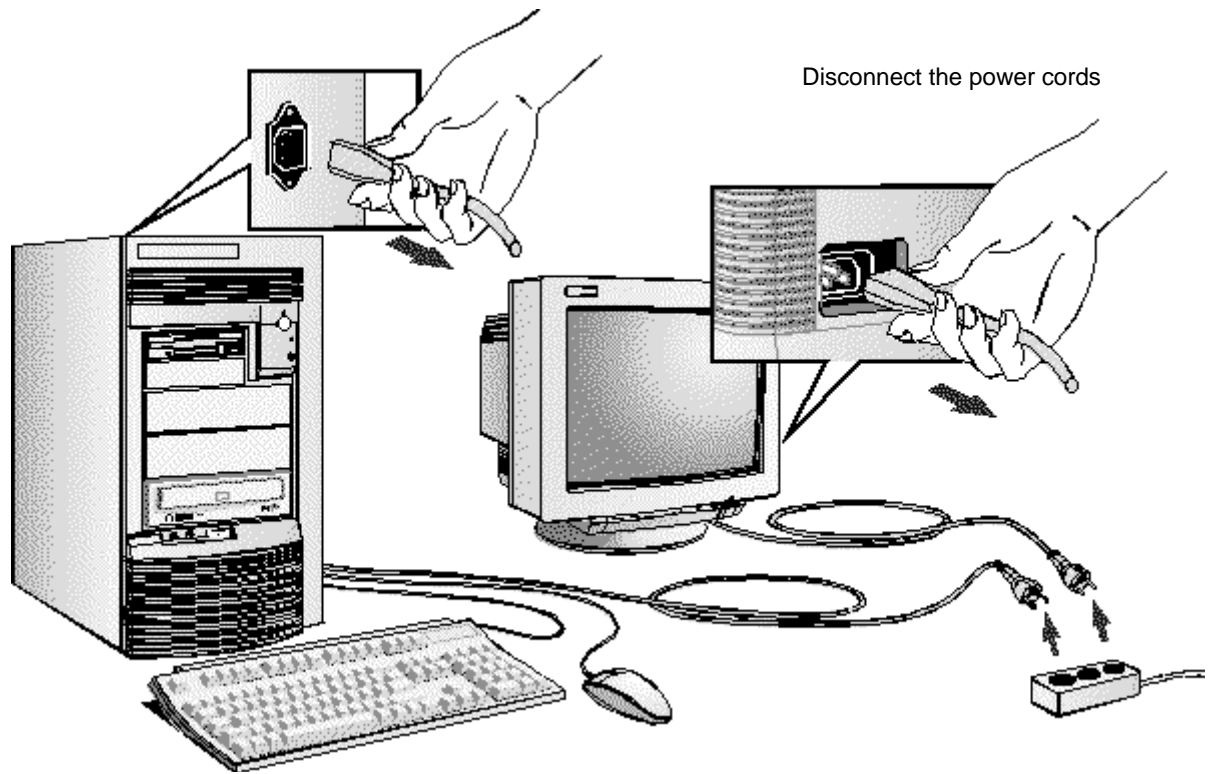
3   If necessary, unlock the cover using the key provided with the computer (the lock is on the back of the computer).

4   Lift the two securing latches at the front of the computer.

Lift the securing
latches
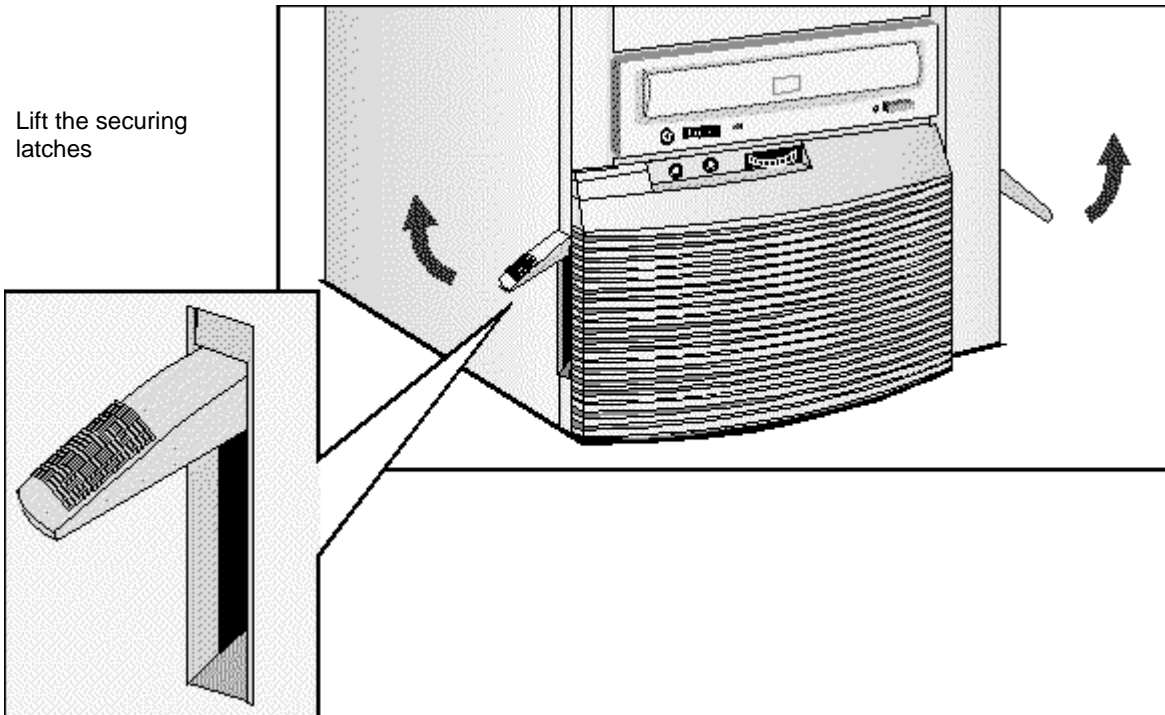
5   Slide the cover forward until it is clear of the computer.

If you have difficulty
removing the cover, try
pushing gently against
the CD-ROM drive with
your thumbs as you pull
the cover toward you
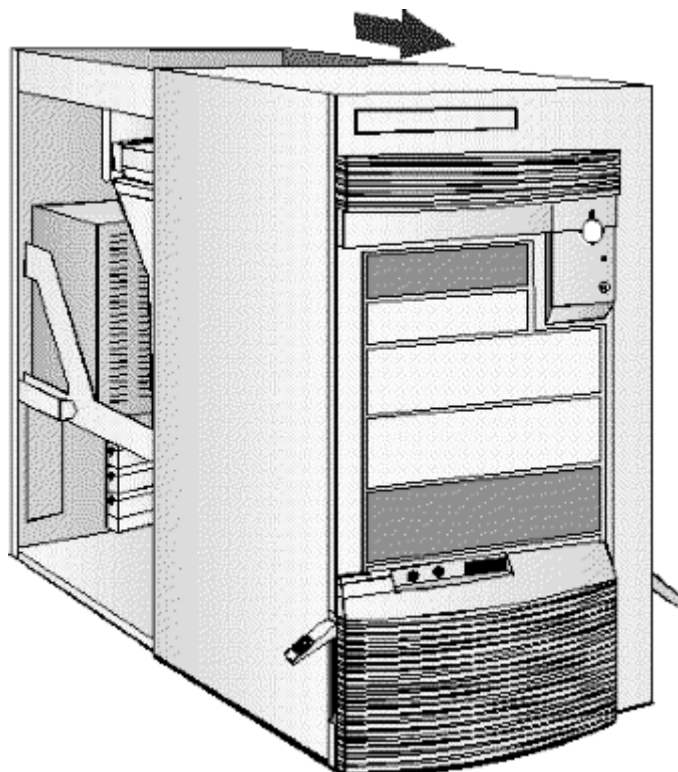
Slide the cover
clear of the
computer

REPLACING THE COVER AFTER INSTALLING ACCESSORIES

1   Check that you have installed all your accessories (and removed a plastic panel from the front of the cover, if you installed a disk drive in a front shelf).

2   Check that all internal cables are safely routed.

3   Check that the cover is unlocked and the latches are outwards.

4   Place the cover in front of the computer and ensure that the two lips at the bottom of the case slide onto the two rails at the base of the computer.

Slide the cover into position

Check that the lips at the bottom of the case slide onto the rails at the base of the computer
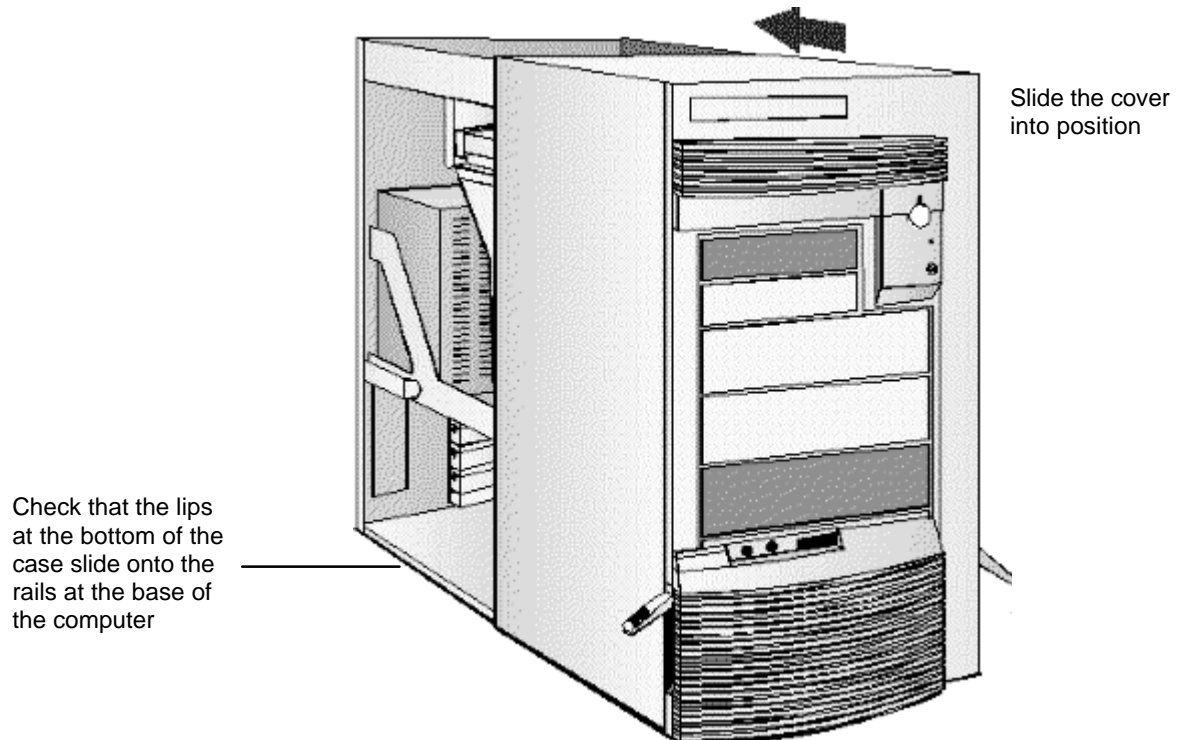
5   Slide the cover into position.

6   Push the two latches at the front of the cover downwards until they click into position.

Lock the cover
(at the back of
the computer)

Push the
latches down
to secure the
cover
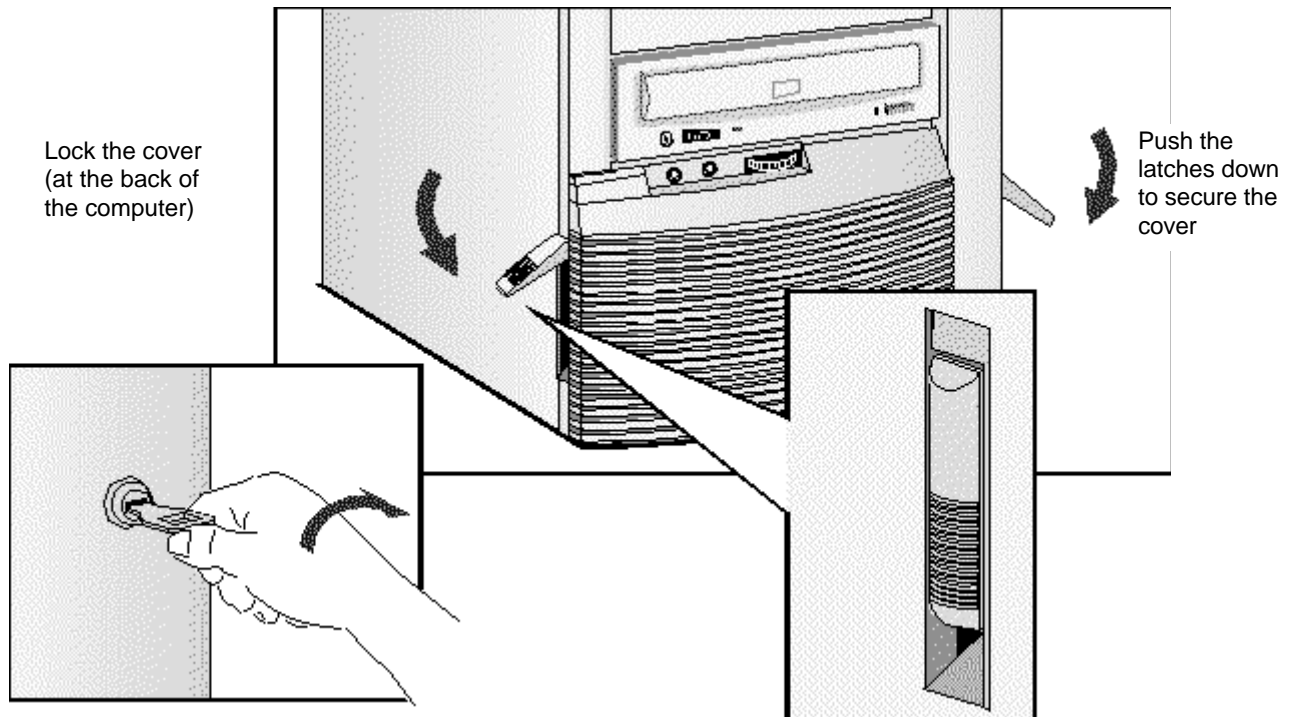
7   If required, lock the cover using the key.

8   Reconnect all cables and power cables.

MOVING THE POWER SUPPLY

You can slide the power supply unit out of the computer to improve access to the system board and the cables at the rear of the disk drives.

1   Disconnect the computer's power cord and any telecommunications cable.

2   Remove the computer's cover (see "Removing and Replacing the Cover" earlier in this chapter).

3   Unscrew the two self-retaining screws at the back of the power supply.

Unscrew the
self-retaining
screws
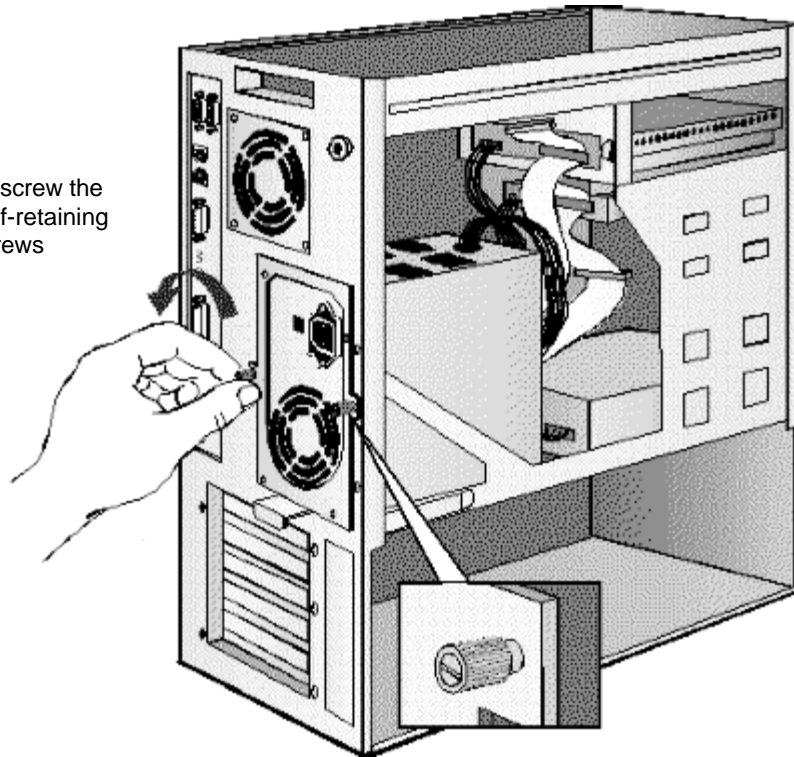
4   Using the small handle at the base of the power supply unit, slide the power supply out of
    the computer until it stops—the power supply unit remains connected to the computer

Slide the power
supply unit clear
of the computer
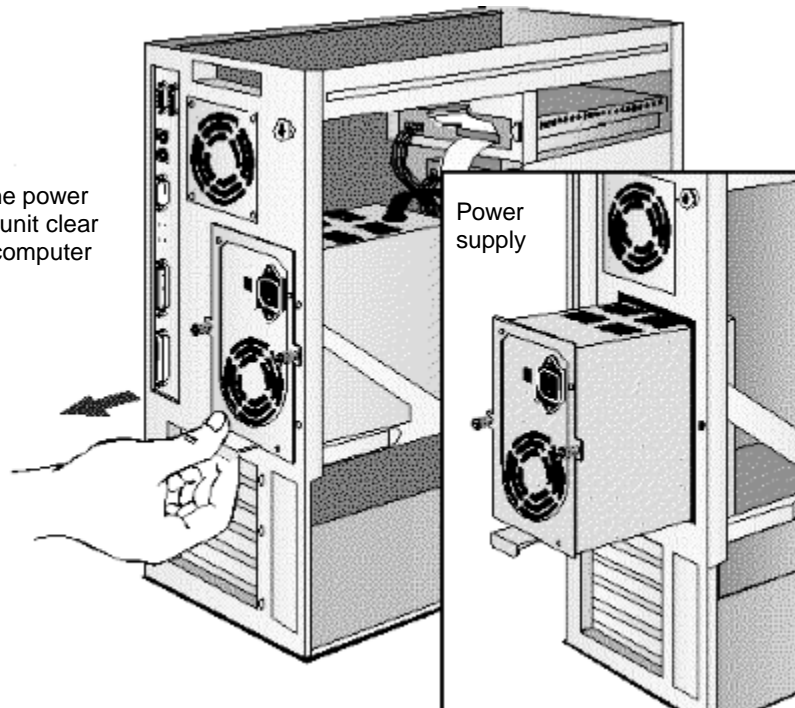
Power
supply

REPLACING THE POWER SUPPLY AFTER INSTALLING ACCESSORIES

1   Check that all internal cables are safely routed.

2   Slide the power supply back into the computer.

3   Tighten the two self-retaining screws.

INSTALLING MEMORY

MAIN MEMORY MODULES
Your PC is supplied with main memory. If you need more main memory to run your application software, you can install up to a total of 256 MB. Main memory upgrades are available in pairs of 8 MB, 16 MB, or 32 MB.

Memory modules must be installed in identical pairs of the same size and same type (a pair of ECC or a pair of non-ECC) from bank A, up to bank D. For a list of available memory modules, refer to the beginning of this chapter.

If your PC supports ECC (error correcting code) memory, error correcting will be disabled if any non-ECC memory is installed.

WARNING:	**Static electricity can damage electronic components. Turn all equipment OFF. Don't let your clothes touch the accessory.**
	To equalize the static electricity, rest the accessory bag on top of the power supply while you are removing the accessory from the bag. Handle the accessory as little as possible and with care.

To install a pair of main memory modules:

1   Disconnect the computer's power cord and any telecommunications cable.

2   Remove the computer's cover (see "Removing and Replacing the Cover" earlier in this chapter). The location of the memory modules is shown here.
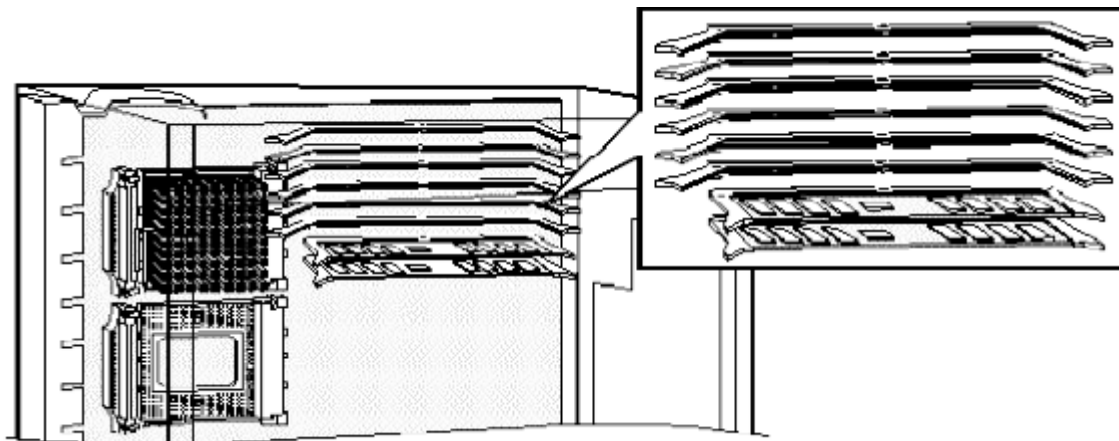
3   Slide each memory module into the slot at 90° to the system board (hold the memory module with the cutouts closest to the processor).

Slide the memory module into the slot at 90°   Push the module until the retaining clips click into position
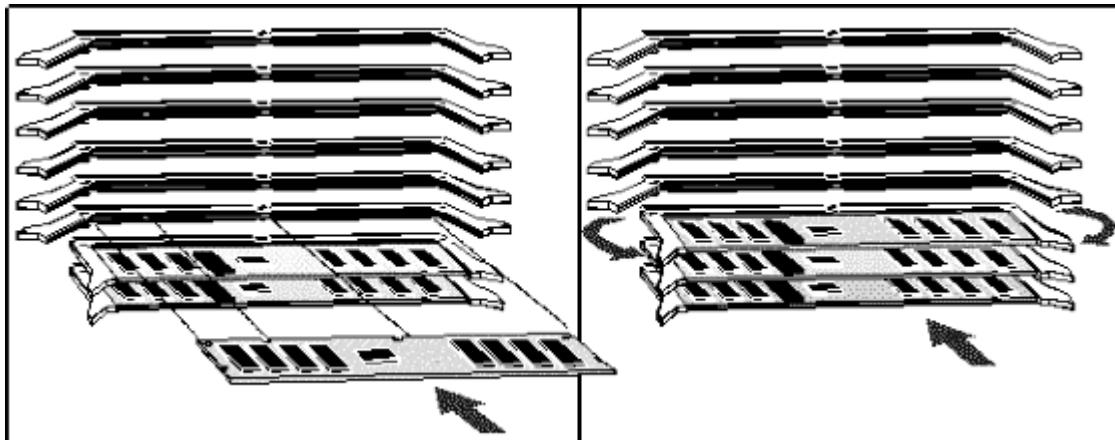
4   *Firmly* press each memory module *completely* into the connector until the retaining clips click into position.

5   Repeat this procedure for each pair of memory modules you are installing.

6   Install any other accessories before replacing the cover (see "Removing and Replacing the Cover" earlier in this chapte). Reconnect all cables and power cords.

Completing the Main Memory Installation Procedure:

1   Switch on the PC. When `Error 0250` appears (indicating that the Power-On-Self-Test has detected a change in your memory configuration) follow the displayed instructions to run the Setup program.

2   Check that Setup has automatically detected and configured the **Memory Size** fields. Ensure the **TOTAL** memory is correct. If it is incorrect, check that you have correctly installed the memory modules.

3   Set the extended memory limit field to **Y** if you use software designed for i286 processors (or earlier processors) that cannot work with more than 16 MB total memory.

4   Press [F3] to save and exit the Setup program.

INSTALLING MORE MEMORY ON THE MGA VIDEO ADAPTER

If you need to have more video memory to display more colors, higher resolutions, or for increased speed, you can install more video memory on the MGA Video Adapter (order D3557A, 2 MB WRAM upgrade). Some of the available video resolutions are listed below (refer to chapter 5 for more detailed information on video resolutions).

Resolution:	Video memory required for these colors:			
	256 colors (8 bpp)	64 K colors hi-color (16 bpp)	16.7 M colors true-color (24 bpp)	16.7 M colors true-color (32 bpp)

640 x 480	2 MB			
800 x 600	2 MB			
1024 x 768	2 MB		4 MB	
1280 x 1024	2 MB	4 MB		8 MB

> **WARNING:** **Static electricity can damage electronic components. Turn all equipment OFF. Don't let your clothes touch the accessory. Handle the accessory as little as possible and with care.**

To install a video memory module:

1   Disconnect the computer's power cord and any telecommunications cable.

2   Remove the computer's cover (see "Removing and Replacing the Cover" earlier in this chapter).

3   Remove the MGA video adapter from the accessory slot and place it on a static-free flat surface.
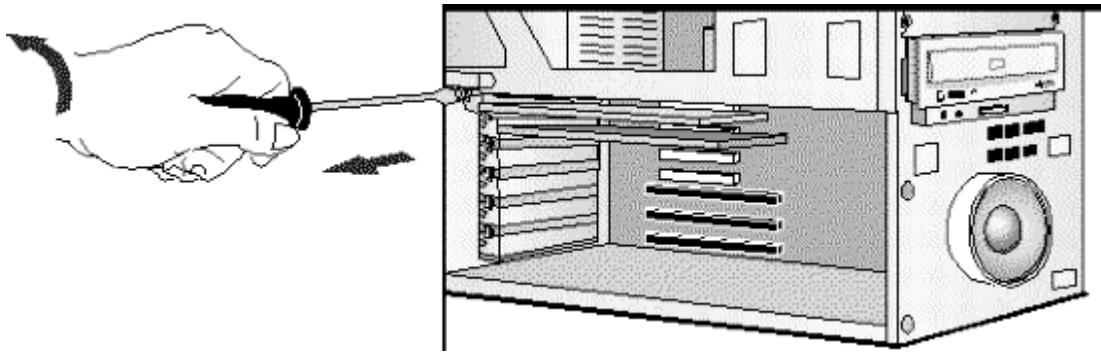
4   Install the memory module on the MGA video adapter.
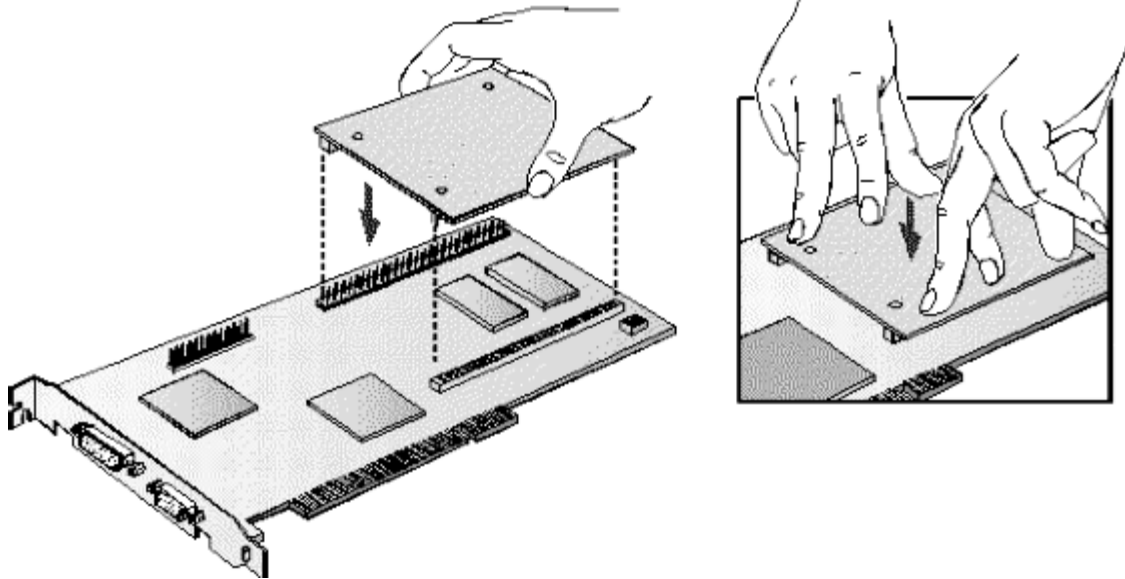
5   Replace the MGA video adapter in the computer.

6   Install any other accessories before replacing the cover (see "Removing and Replacing the Cover" earlier in this chapter). Reconnect all cables and power cords.

Completing the Video Memory Installation Procedure

1   Switch on the PC.

2   Check that the Setup program has detected and configured the Video memory.

NOTE	If you need to use a special video driver for your application, you may be asked to insert the CD-ROM or diskette containing the driver.

Video Adapter accessories available from other sources

Additional accessories, including memory upgrades and a video MPEG module, are available for your video adapter. However, these accessories cannot be ordered from HP. Contact your dealer for more details about these accessories.

INSTALLING ACCESSORY BOARDS

The PC has six accessory board slots:
- Slot 1 (the bottom slot) for full-length 16-bit ISA boards
- Slot 2 for full-length 16-bit ISA boards
- Slot 3 for either a full-length 32-bit PCI or a 16-bit ISA board
- Slot 4 can be used for a full-length 32-bit PCI board
- Slot 5 for a full-length 32-bit PCI board
- Slot 6 (the top slot) for a full-length 32-bit PCI board.

CONFIGURING ACCESSORY BOARDS WITH PLUG AND PLAY

Plug and Play is an industry standard for automatically configuring your PC's hardware resources and the accessory boards installed in it. Accessory boards which support the Plug and Play standard can be detected and configured automatically by your PC.

Your PC has configurable support for Plug and Play in the system BIOS. When you start your PC, the Plug and Play system BIOS can detect automatically which hardware resources (IRQs, DMAs, memory ranges, and I/O addresses) are used by the system-based components.

Operating System Support for Plug and Play

Plug and Play is not supported by all operating systems (OS). Use this table to check the level of support provided by your OS.

Your Operating System	Level of Support for Plug and Play
Windows 3.11	Supported by ISA Configuration Utility (ICU)
Windows 95	Full support (integrated in OS)
Windows NT	None
OS/2 Warp	Support for PCMCIA cards only
SCO Unix	None
NextStep	None
Solaris	None

Configuring Plug and Play with the Setup program

You can use the Setup program to select the level of support provided by the system BIOS for Plug and Play-compatible accessory boards.

Configuring Setup for Windows 95

1   Turn on the PC and press [F2] when `<Setup=F2>` appears.

2   Highlight the **Plug and Play Device Management** line and use [F7] or [F8] to select **Full**.

   • When Full is selected, all Plug and Play accessories will be configured automatically. However, if you install a non-Plug and Play accessory board, you must use the Add New Hardware wizard to determine a conflict-free setting for the board.

3   Press [F3] to save your selection and exit from the Setup program.

Configuring Setup for Other OS

1   Turn on the PC and press [F2] when `<Setup=F2>` appears.

2   Highlight the **Plug and Play Device Management** line and use [F7] or [F8] to select **Full**.

   When Full is selected, all Plug and Play accessories will be initialized by the BIOS. However, you will need to determine a conflict-free setting for the board.

3   Press [F3] to save your selection and exit from the Setup program.

Configuring Accessory Boards with Windows 95

Plug and Play ISA Accessory Boards

Windows 95 can detect and configure automatically Plug and Play accessories if **Plug and Play Device Management** is set to Full in the Setup program.

Non-Plug and Play ISA Accessory Boards

You must run the Add New Hardware wizard to configure non-Plug and Play accessories. The Add New Hardware wizard can identify automatically many accessory boards.

If the Add New Hardware wizard does not recognize the accessory board, you can manually select the accessory board from a list of supported products. Windows 95 is preloaded with configuration details for many non-Plug and Play accessory boards.

Windows 95 will determine the recommended settings for each ISA non-Plug and Play board you want to install. These settings may be different from those recommended by the accessory board's manufacturer. In this case, the board's jumper settings and driver options must be altered.

To run the Add New Hardware wizard:

1   Click the Start button on the Windows 95 task bar.

2   Point to Settings.

3   Double-click Add New Hardware.

4   Follow the instructions provided by the Add New Hardware wizard to configure the accessory board.

INSTALLING THE BOARD

1   Before installing the board, refer to "Installing Accessory Boards" earlier in this chapter for important Plug and Play configuration information.

> **NOTE**   PCI boards are configured automatically when installed in the PC.

2   Disconnect the computer's power cord and any telecommunications cable.

3   Remove the computer's cover and power supply (see "Removing and Replacing the Cover" and "Replacing the Power Supply after Installing Accessories" earlier in this chapter).

4   Find a free slot. ISA boards should be installed in the lowest available slot and PCI boards in the highest available slot to ease cable routing.

     Some boards may have preferred locations and special installation instructions detailed in their manuals.

5   Unscrew and remove the slot cover. Store it in a safe place.
     If the slot cover is tight, loosen the screws on the adjacent slots.

Unscrew and remove
the slot cover
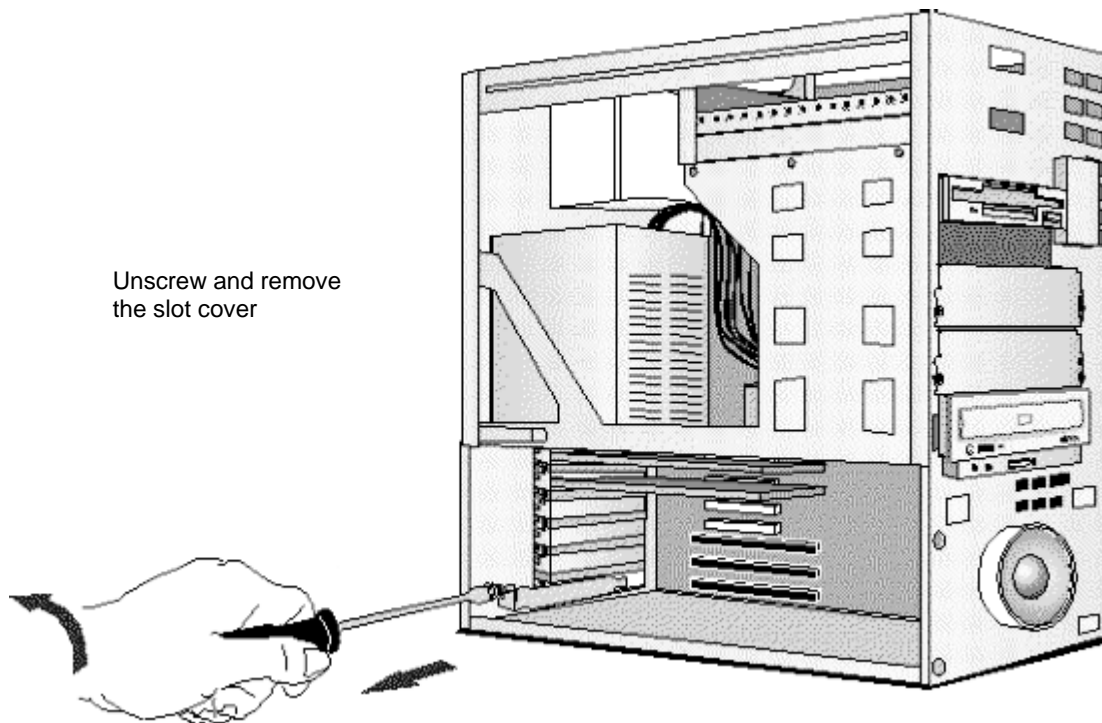
6   Hold the board horizontally by its "top" edge. Slide it into the board guide of the chosen
     slot. Do *not* bend the board.

Slide the
accessory
board into
position
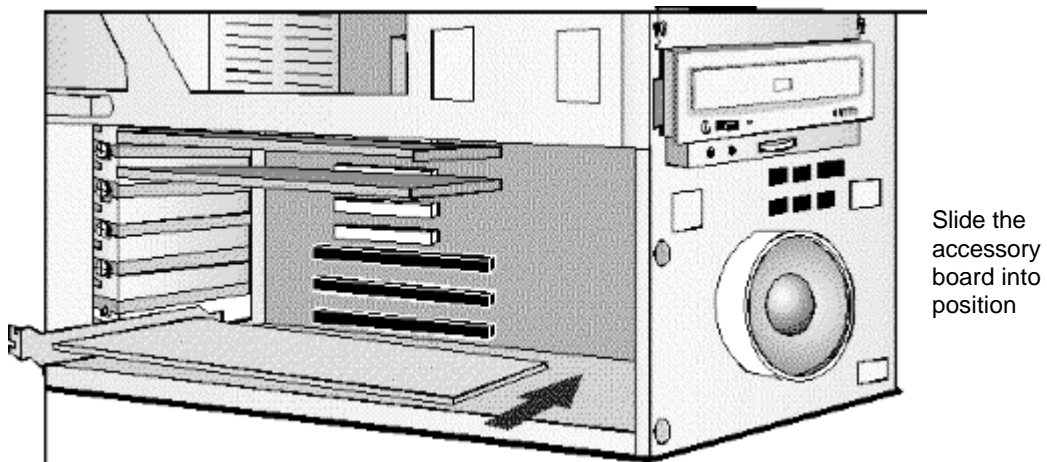
7   Align the board's connector with the slot's socket. Firmly press the board into the socket.
     Ensure the board's connector engages *completely* with the socket and does not touch
     components on other boards.

8   Secure the board by replacing the slot cover screw.
     If you loosened the screws on adjacent slots, tighten them.

Secure the board
in position
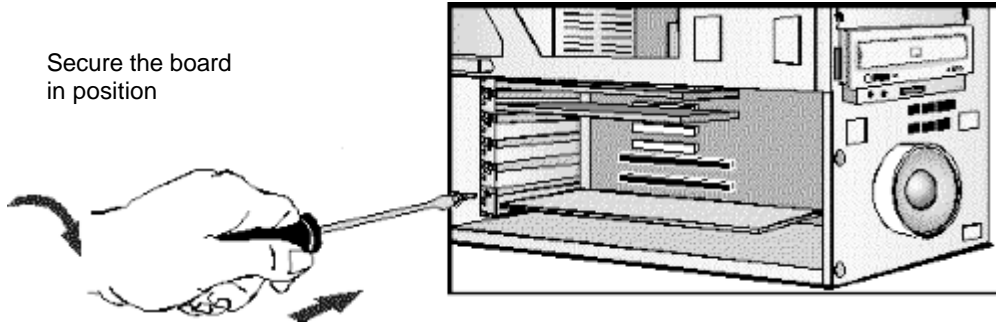
9   If you install a VESA-standard video accessory board that uses the MGA video adapter,
     connect the accessory board's cable to the VESA pass-through connector on the MGA
     adapter board.

VESA Pass-Through
Connector
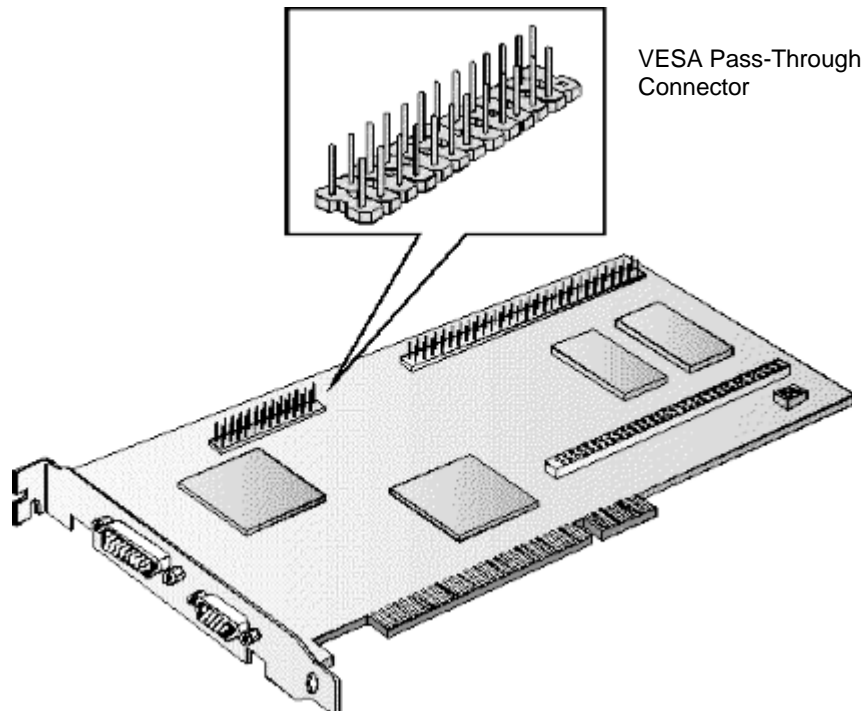
10   If you install a Creative Labs wavetable accessory board that operates with the integrated
     SoundBlasterTM audio interface, connect the board's interface cable to the wavetable
     interface connector on the system board.

Wavetable interface connector
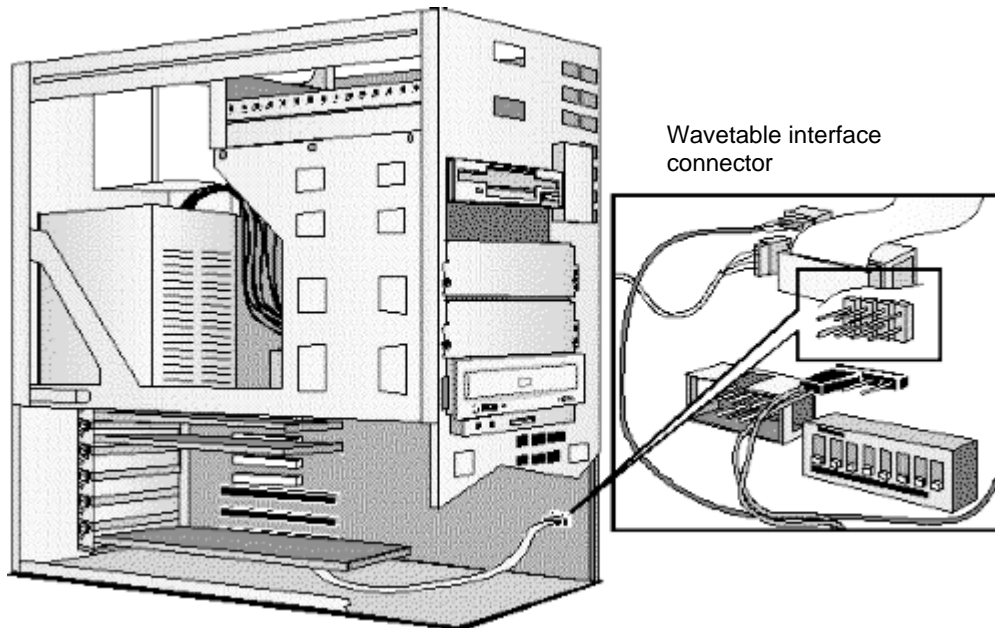
11   Install any other accessories before replacing the cover (see "Replacing the Cover after Installing Accessories" earlier in this chapter). Reconnect all cables and power cords.

Completing the Installation of an ISA Accessory Board

If you have installed an ISA accessory board that uses IRQ 9, 10, 11, or 15, you must run the Setup program and reserve the IRQ for the accessory board. This allows PCI devices to be automatically configured.

1   Turn on the PC and press [F2] when `<Setup=F2>` appears.

2   Highlight the **IRQ** field you want to change, for example **IRQ 11**.

3   Press [F7] or [F8] to make the IRQ available for PCI (**Available for PCI**) or make it unavailable for PCI (**Used by an ISA Board**).

4   Press [F3] to save any changes you made and exit the SETUP program.

NOTE	You should always leave at least one IRQ available for use by the integrated PCI devices.

INSTALLING DISK DRIVES

If you need extra mass storage space for your application software, you can install additional mass storage devices.

The computer has two internal shelves (for hard disk drives) and five front-access drive shelves (for front-access disk drives and hard disk drives).

Your computer is supplied with one 3.5-inch flexible disk drive and a CD-ROM drive. If your computer is supplied with a hard disk, the hard disk will be installed in the first internal shelf.

two internal shelves
for 3.5-inch hard disks

two shelves for
3.5-inch disk drives

three shelves for
5.25-inch disk drives
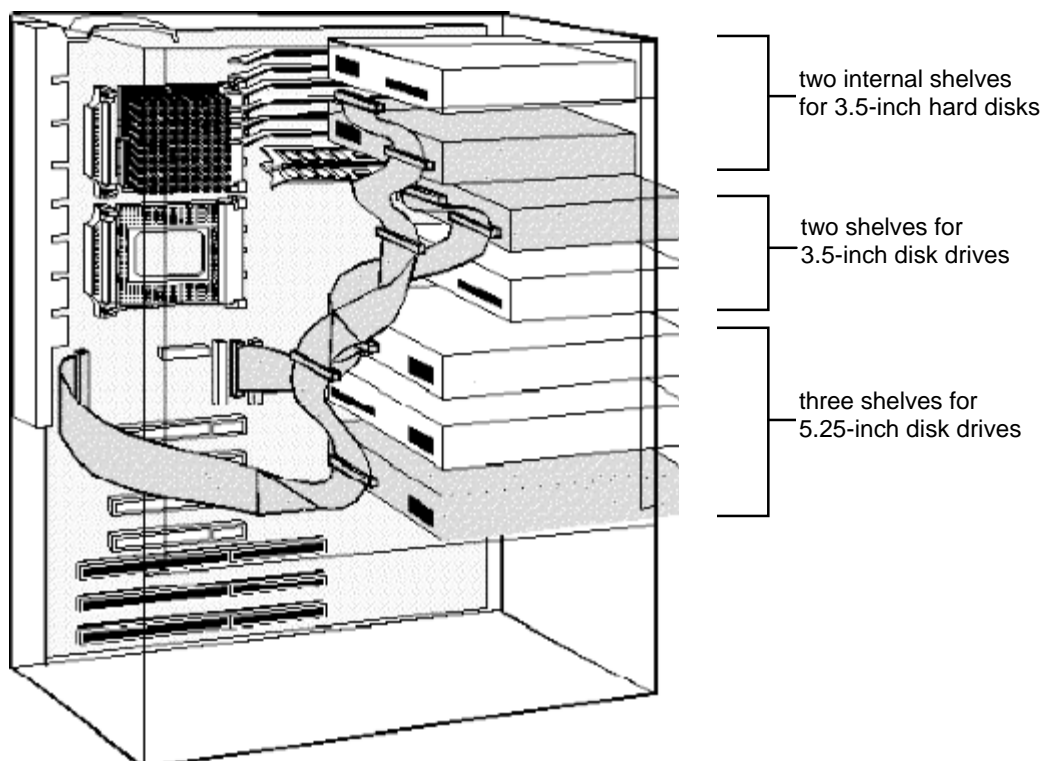
INSTALLING A HARD DISK DRIVE

The computer has an integrated SCSI controller and an integrated Enhanced IDE controller.

• The Enhanced IDE controller supports up to four IDE devices:

  • two IDE devices can be connected to the Primary Channel cable (connected to the grey connector on the system board)
  • two IDE devices can be connected to the Secondary Channel cable (connected to the red connector on the system board)

• The SCSI controller supports up to seven SCSI devices
  (up to five SCSI devices can be connected to the internal SCSI cable).

Before Installing an IDE Hard Disk

Refer to the drive's installation guide to see if you must set jumpers or if there is a special installation procedure to follow.

Before Installing a SCSI Hard Disk

If you are installing an additional SCSI drive you must select a SCSI address for the new drive. SCSI addresses range from 0 to 7, with SCSI address 0 used by the first SCSI drive and SCSI address 7 reserved for the integrated SCSI controller.

NOTE	You don't need to select a SCSI address for Plug and Play SCSI hard disks (SCSI hard disks which support the SCAM protocol).

You should assign an unused SCSI address to the second SCSI hard disk drive (for example, SCSI address 1).

The SCSI address is usually configured with jumpers on the SCSI hard disk drive. Refer to the installation guide supplied with the drive for information on selecting a SCSI address.

Some SCSI disk drives may have termination resistors that must be removed or disabled before installation in your computer. Refer to the drive's installation guide for more details and to see if there is a special installation procedure to follow.

Installing a Hard Disk Drive in an Internal Shelf

| NOTE	Hard disk drives ordered from HP are supplied with a mounting tray. If you order your drive from another supplier, you may need to order a mounting tray from HP. You should order product number D2037A (3.5-inch hard disk mounting tray).

1   Disconnect the computer's power cord and any telecommunications cable.

2   Remove the computer's cover (see "Removing and Replacing the Cover" earlier in this chapter).

3   Slide the power supply out to improve access to the drive (see "Moving the Power Supply" earlier in this chapter).

4   Install the drive in the first or second internal shelf.
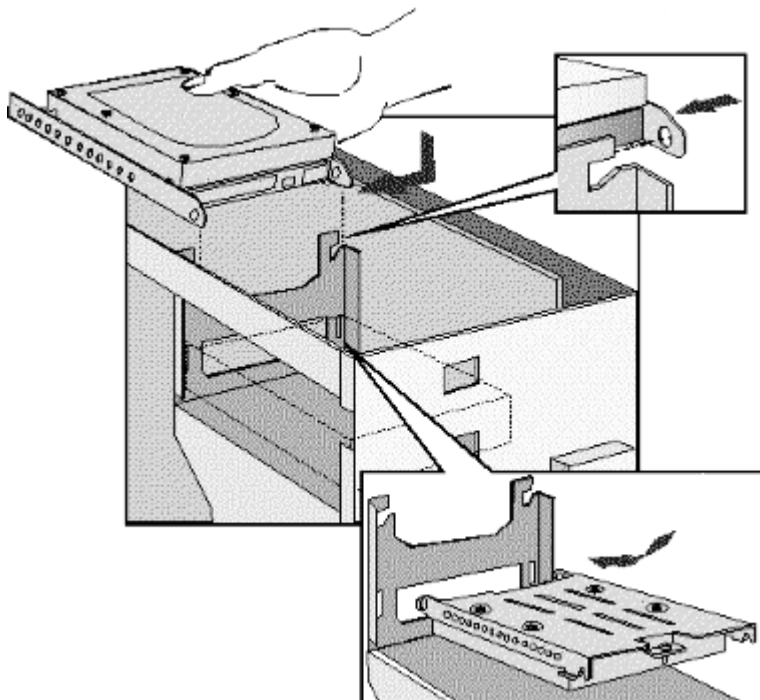
If you install the drive in the first (uppermost) shelf:

Align the drive (upside down) with the hinges on the shelf, then insert it into the hinges

If you install the drive in the second shelf:

Align the drive with the slots in the shelf, then insert it carefully, as shown here

5   If the drive is being installed in the first shelf, rotate the drive into position.

Rotate the drive
into position
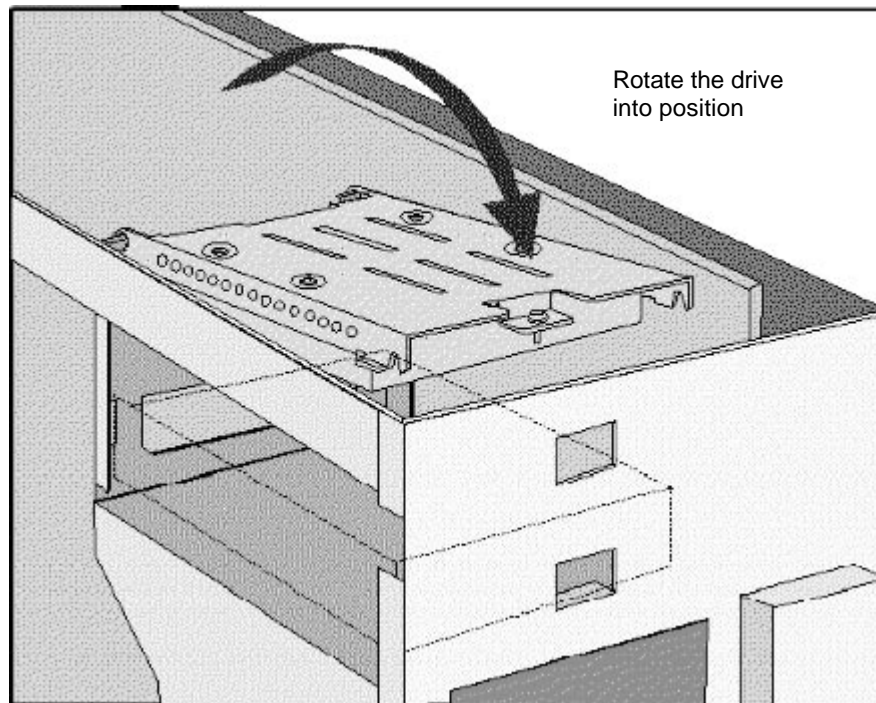
6   Secure the drive using the screw provided.

Secure the drive
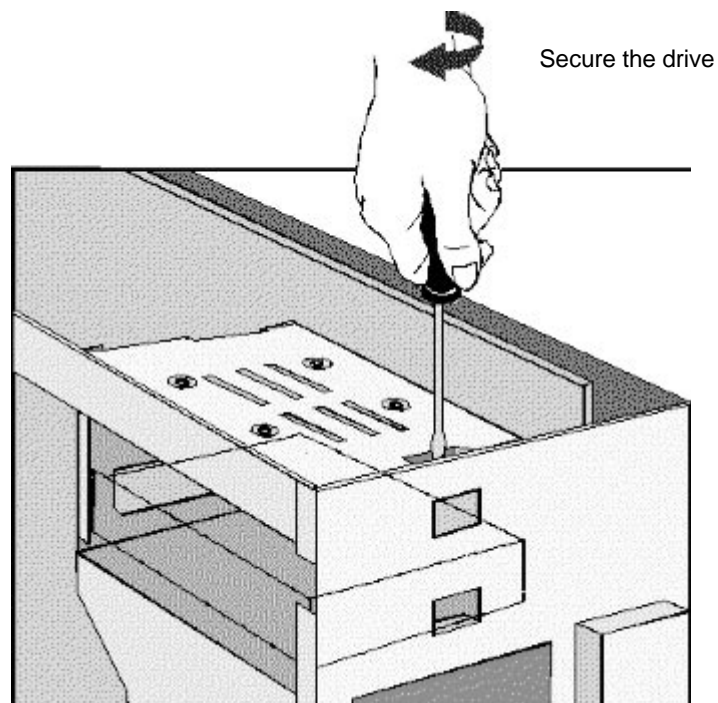
7   Locate the appropriate data cable for the hard disk drive.

IDE drives should be
connected to the
Primary IDE Channel
cable (this cable is
connected to the grey
connector on the
system board)

NOTE
The IDE data cables
are in a bag supplied
separately with your
PC

SCSI drives can be
connected to any free
connector on the
SCSI cable
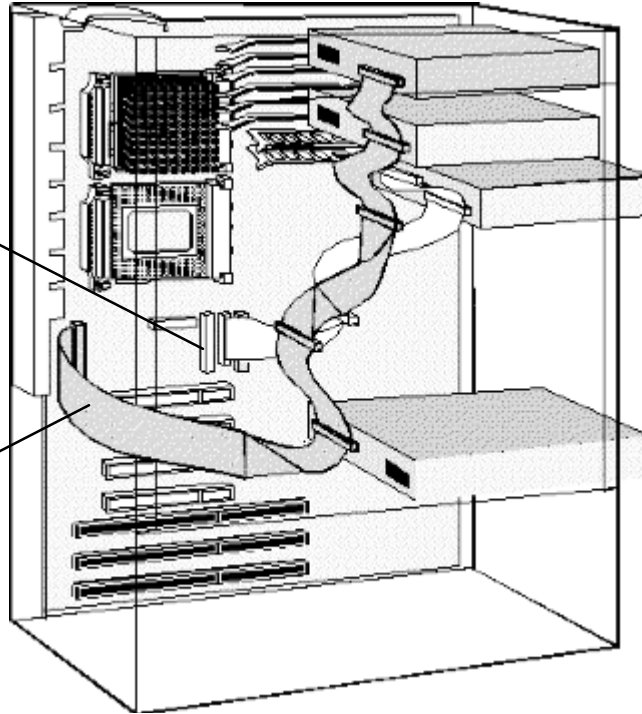
8   Connect the power cable and the data cable to the rear of the drive. (The connectors are
     shaped to go in one way only.)

Power Cable

Data Cable
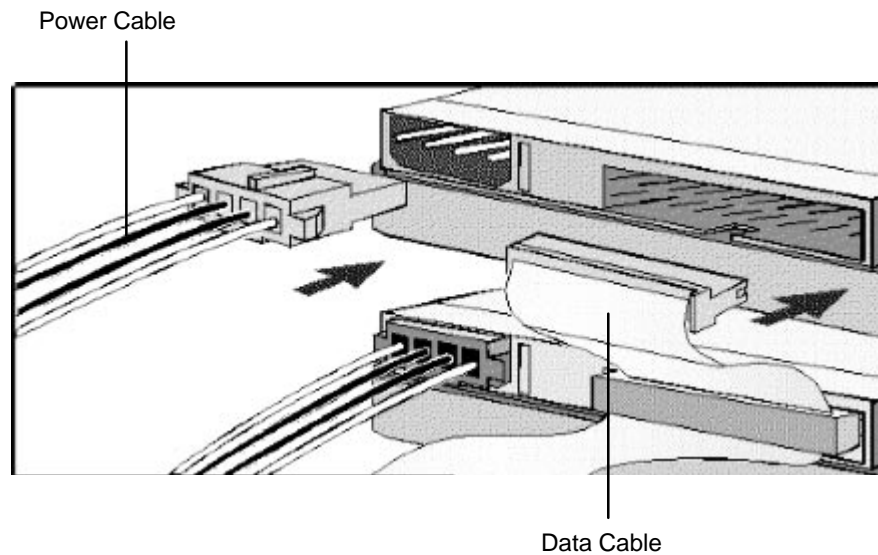
9   Install any other accessories before completing the installation.

10   See "Completing the Installation of a Hard Disk Drive" later in this chapter to complete the
     installation.

Installing a Hard Disk Drive in a Front-Access Shelf

1   Disconnect the computer's power cord and any telecommunications cable.

2   Remove the computer's cover (see "Removing and Replacing the Cover" earlier in this chapter).

3   Slide out the power supply to provide better access to the disk drive cables (see "Moving the Power Supply" earlier in this chapter).

4   Unscrew and remove an unused drive tray.

Remove the drive tray
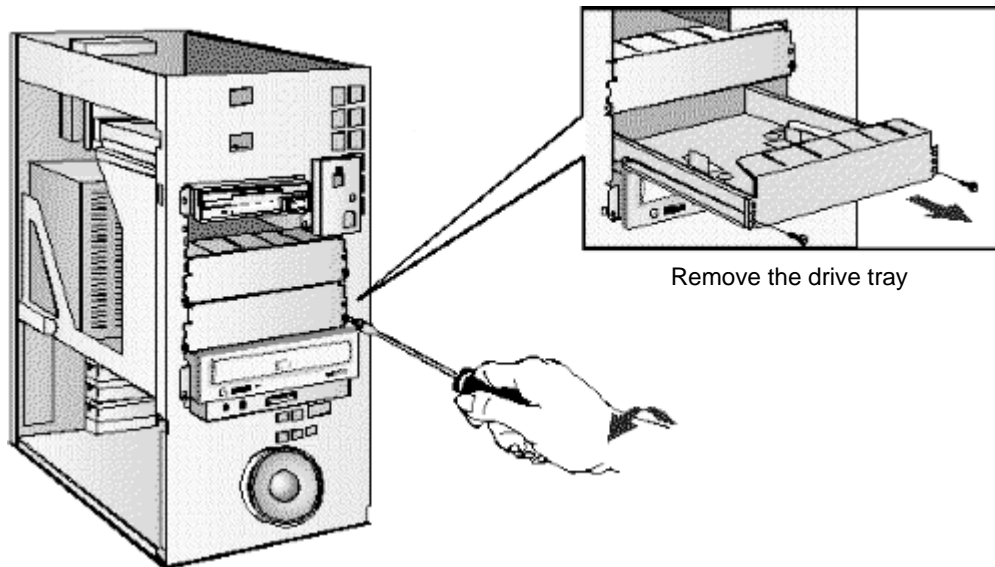
5   Mount the drive on the tray as shown below.

Set the drive on the tray   Fix the drive to the tray
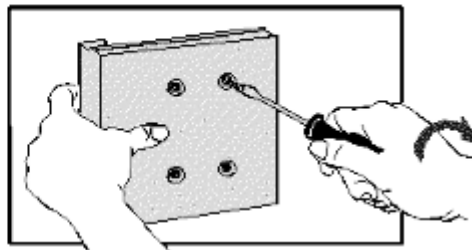
6   Slide the drive tray into the drive shelf and secure it.

Slide the drive tray into
the drive shelf
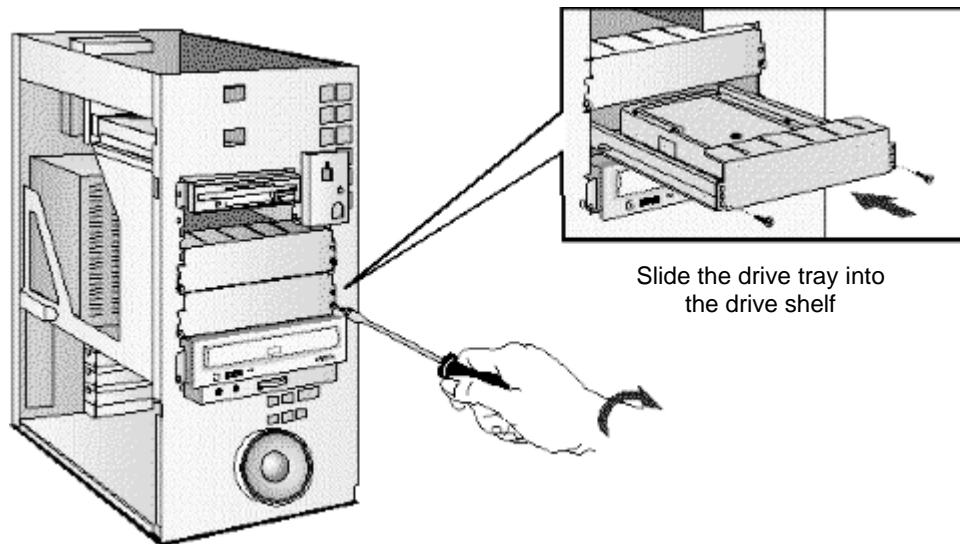
7   Locate the appropriate data cable for the disk drive.
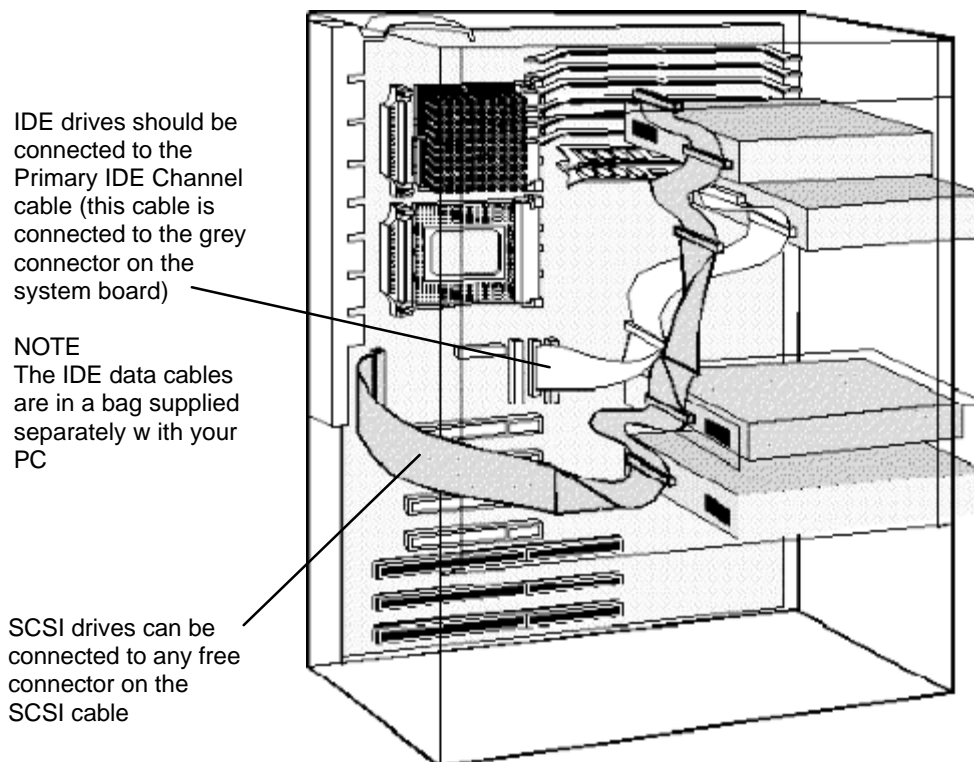
IDE drives should be
connected to the
Primary IDE Channel
cable (this cable is
connected to the grey
connector on the
system board)

NOTE
The IDE data cables
are in a bag supplied
separately w ith your
PC

SCSI drives can be
connected to any free
connector on the
SCSI cable

8   Connect the data and power cables to the rear of the device. (The connectors are shaped
     to go in one way only.)

Data Cable

Power Cable
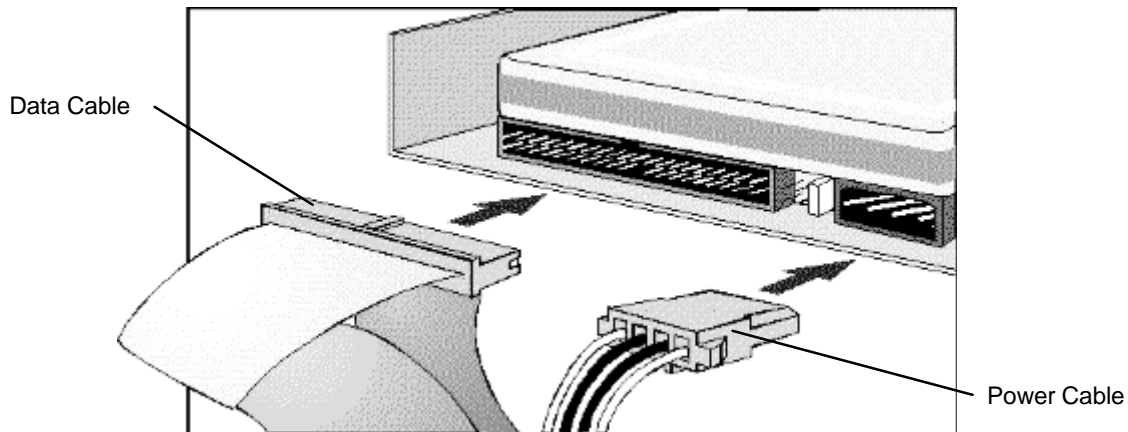
9   Slide the power supply back into position, and tighten its self-retaining screws (see "Replacing the Power Supply after Installing Accessories" earlier in this chapter).

10 Install any other accessories before replacing the cover and completing the installation.

11 "Completing the Installation of a Hard Disk Drive" later in this chapter to complete the installation.

COMPLETING THE INSTALLATION OF A HARD DISK DRIVE

When a SCSI Drive is Installed

1   Switch on the computer.

2   When the SCSI BIOS initialization messages are displayed, check that the details for the new SCSI drive have been correctly detected.

Refer to the operating system documentation for information on formatting a drive.

When an IDE Drive is Installed

1   Switch on the computer.

2   When an error message appears, follow the instructions provided by the Error Message Utility. When prompted, press [F2] to run the Setup program.

3   In the **IDE Primary Channel** (or **IDE Secondary Channel**) section, check that the details for **Device 1** (or **Device 2**) have been correctly detected by the Setup program.

4   Press [F3] to save and exit Setup.

Refer to the operating system documentation for information on formatting a drive.

| NOTE | If an IDE drive is removed, switch on the computer and follow the instructions displayed by the Error Message Utility. When prompted, press [F2] to run the Setup program and select None or SCSI for the missing drive. |

INSTALLING A DRIVE IN A FRONT-ACCESS SHELF

These instructions explain how to install a drive (such as a disk drive, a CD-ROM drive, or a tape drive) in one of the front-access drive shelves. You should also refer to the manual supplied with the drive for any additional installation instructions.

Before Installing an IDE Device

Refer to the drive's installation guide to see if you must set jumpers or if there is a special installation procedure to follow.

Before Installing a SCSI Device

If you are installing a SCSI device (for example, a tape drive) you must select a SCSI address for it. SCSI addresses range from 0 to 7, with SCSI addresses 0 and 1 usually used by the SCSI hard disk drives. SCSI address 7 is reserved for the integrated SCSI controller.

NOTE	You don't need to select a SCSI address for Plug and Play SCSI devices (SCSI devices which support the SCAM protocol).

You should assign an unused SCSI address to the new SCSI device (for example, SCSI address 2).

The SCSI address is usually configured with jumpers on the SCSI device. Refer to the installation guide supplied with the device for information on selecting a SCSI address. Note that the device may be preconfigured for SCSI address 2 or 3 by default.

Some SCSI devices may have termination resistors that must be removed or disabled before installation in your computer. Refer to the device's installation guide for more details and to see if there is a special installation procedure to follow.

| NOTE	Drives ordered from HP are supplied with mounting rails. If you order your drive from another supplier, you may need to order drive mounting rails from HP. You should order product number D2880A for 5.25-inch disk drive rails or product number D3566A for 3.5-inch disk drive rails.

1   Disconnect the computer's power cord and any telecommunications cable.

2   Remove the computer's cover (see "Removing and Replacing the Cover" earlier in this chapter).

3   Slide out the power supply to provide better access to the disk drive cables (see "Moving the Power Supply" earlier in this chapter).

4   If installing a drive in a 5.25-inch wide shelf, remove the drive tray and put it in a safe place.

Remove; the drive tray if installing a 5.25-inch drive

Slide the drive into position

Secure the drive in position

Mounting Rails
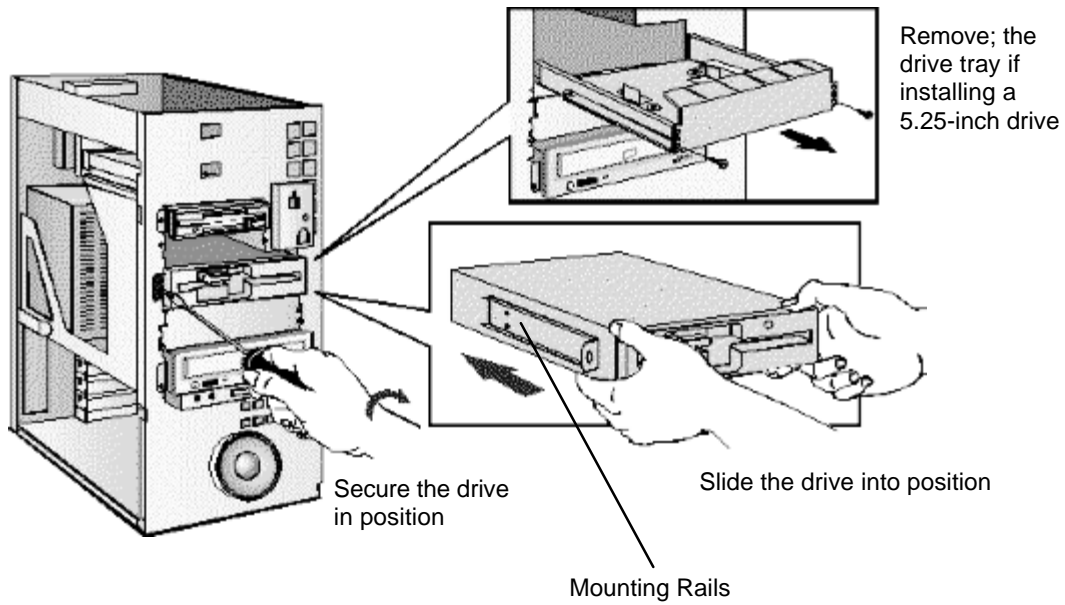
5   Slide the drive into the shelf.

6   Secure the drive in position using the screws provided with the drive.

7   Locate the appropriate data cable for the device
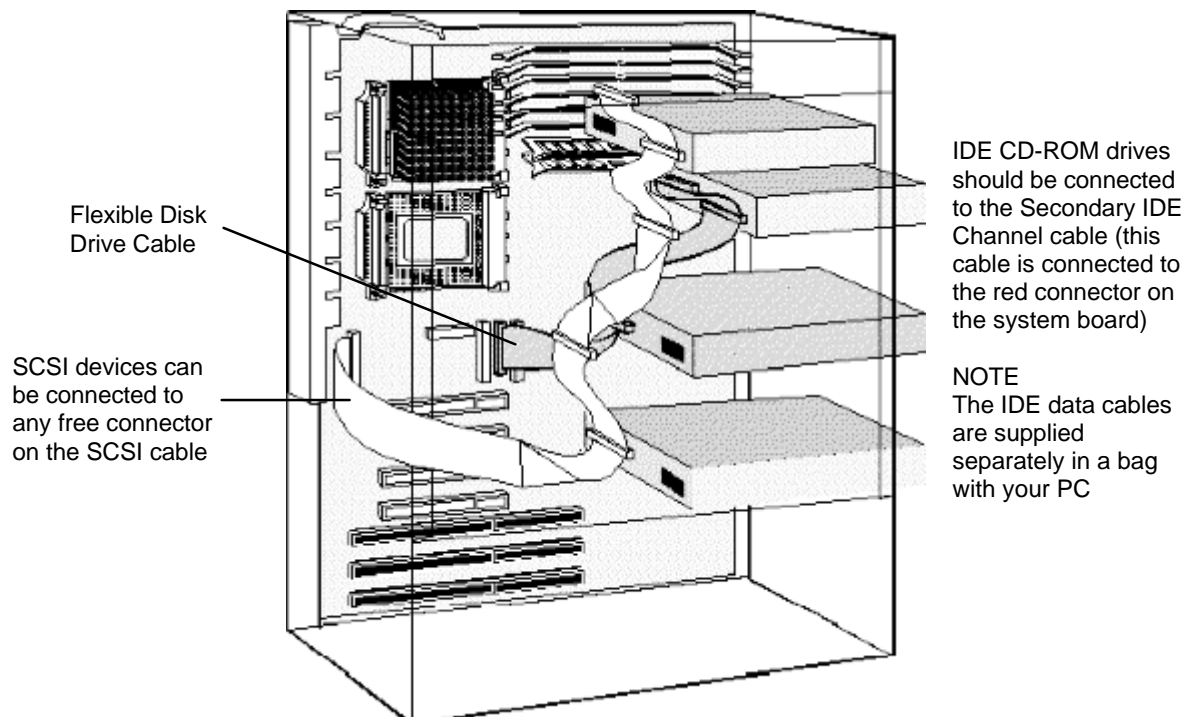
Flexible Disk Drive Cable

SCSI devices can be connected to any free connector on the SCSI cable

IDE CD-ROM drives should be connected to the Secondary IDE Channel cable (this cable is connected to the red connector on the system board)

NOTE
The IDE data cables are supplied separately in a bag with your PC

8   Connect the data and power cables to the rear of the device. (The connectors are shaped to go in one way only.)

Data Cable

Power Cable
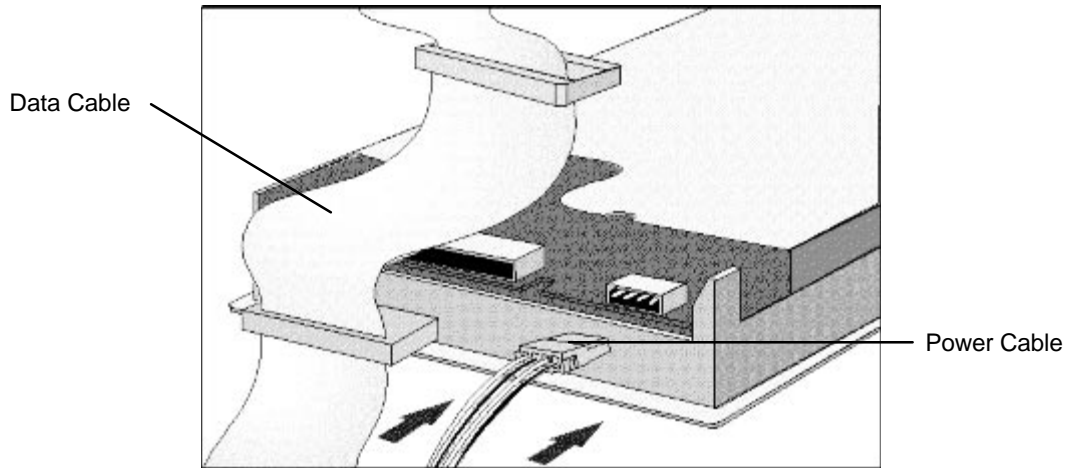
9 Slide the power supply back into position, and tighten its self-retaining screws (see "Replacing the Power Supply after Installing Accessories" earlier in this chapter).

10 Remove the plastic panel from the cover by pulling the panel from the left and unhinging its right-hand side. Store the panel in a safe place.
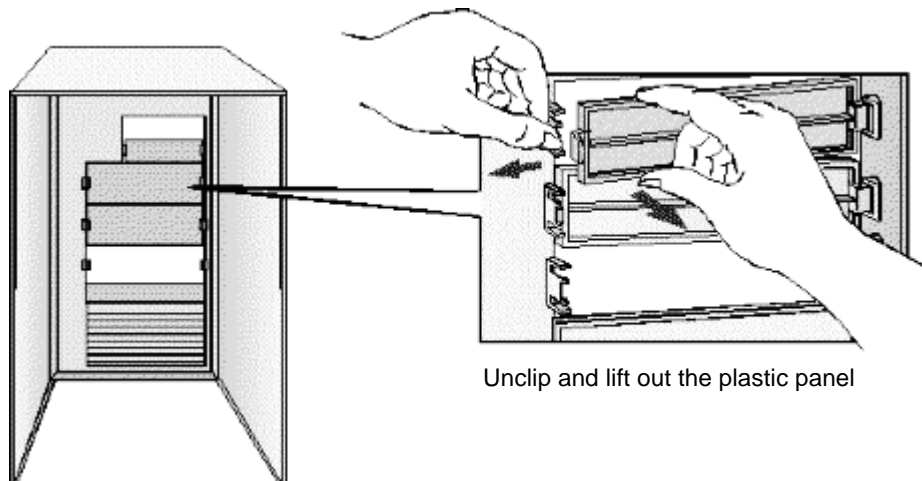
Unclip and lift out the plastic panel

11 Install any other accessories before replacing the cover and completing the installation.

Completing the Installation of an IDE CD-ROM drive

1 Turn on the computer and press [F2] when `<Setup=F2>` appears.

2 In the **IDE Secondary Channel** section of the Setup program, make sure that the CD-ROM drive has been detected.

3 Press [F3] to save and exit the program.

Completing the Installation of a Flexible disk drive

1 Turn on the computer and press [F2] when `<Setup=F2>` appears.

2 Check that the *Setup* program has detected the drive in the **Flexible Disk Drives** section.

3   Press [F3] to save and exit the program.

INSTALLING A PROCESSOR

Some operating systems support a second processor for increased performance. Contact your authorized reseller for up-to-date information. You may also replace the original processor with a faster processor.
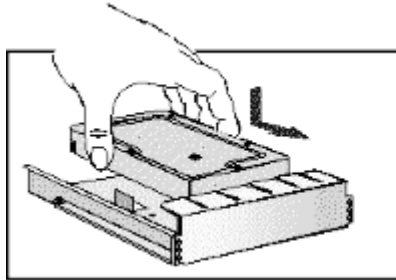
1   Disconnect the computer's power cord and any telecommunications cable.

2   Remove the computer's cover (see "Removing and Replacing the Cover" earlier in this chapter).

3   Remove the airflow guide from above the processor socket.

Remove the airflow guide
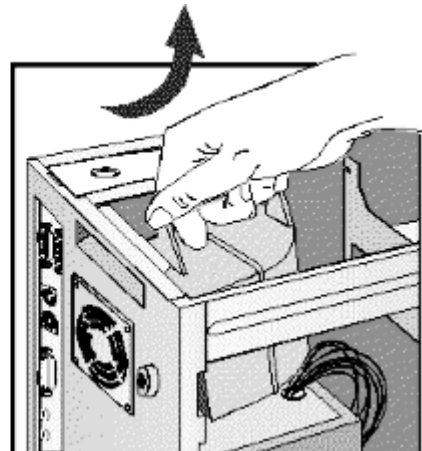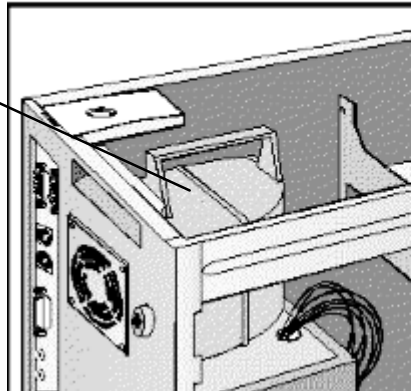
4   Move the power supply to improve access to the processor socket (see "Moving the Power Supply" earlier in this chapter), then carefully place the PC on its side.
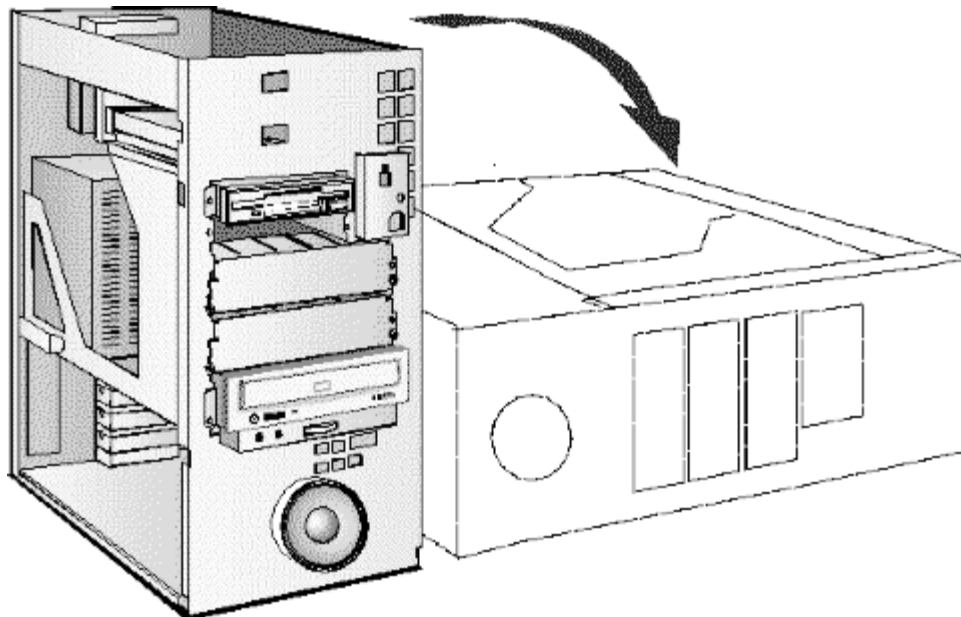
5   Install the VRM module supplied with the processor.
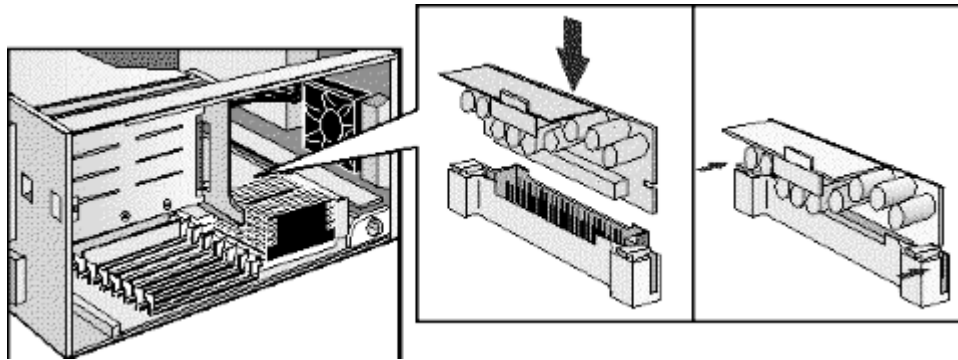
6   Unlock the processor socket and position the processor over it.
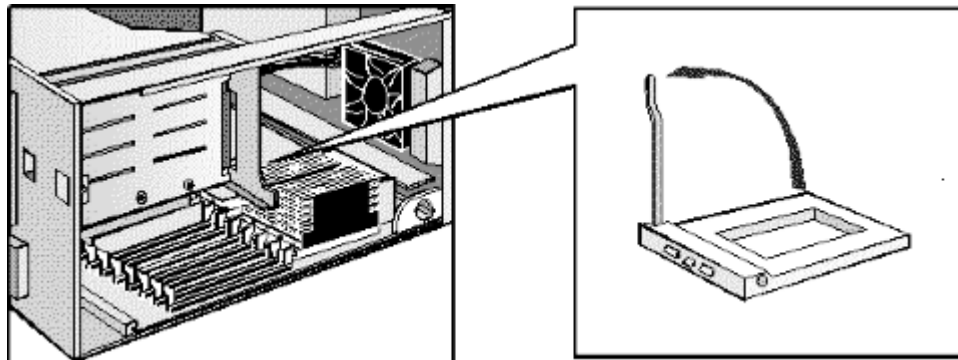
7   Insert the new processor into the socket and lock the processor into place.

Insert the processor
into the socket
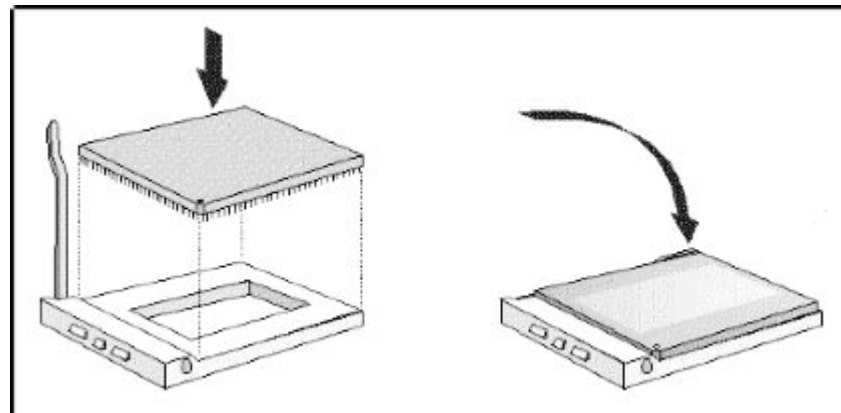
8   Place the heatsink on the processor and attach the retaining clips to the processor socket.

Attach the
heatsink to the
socket
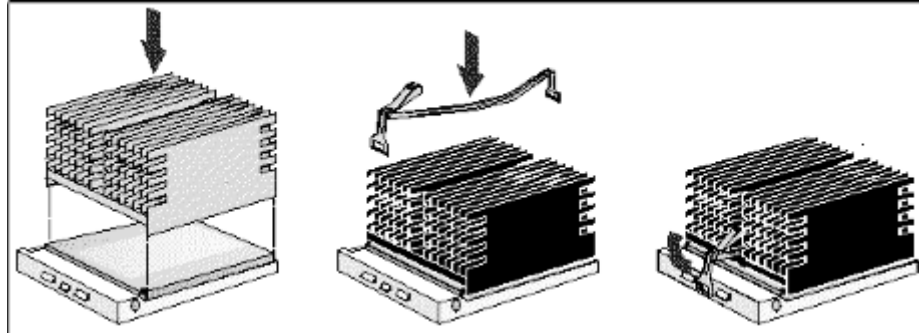
9   Carefully set the PC in the upright position.

10 Slide the power supply back into the computer and tighten the two self-retaining screws.

11 Replace the airflow guide above the processor socket.

COMPLETING THE INSTALLATION OF A PROCESSOR

1   Verify that the system board bus speed switches are correctly configured for the processor.
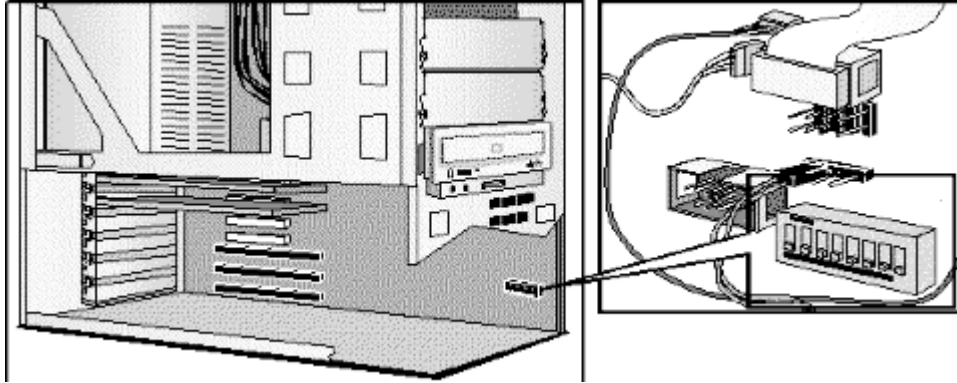
Switch 4	Switch 5	Switch 6	Switch 7	Switch 8	Bus Speed	Processor Speed
ON	OFF	ON	OFF	OFF	60 MHz	150 MHz
OFF	OFF	ON	OFF	OFF	66 MHz	166 MHz
ON	OFF	OFF	ON	OFF	60 MHz	180 MHz
OFF	OFF	OFF	ON	OFF	66 MHz	200 MHz

> **NOTE**   If two processors are installed, both must operate at the same bus speed and processor speed. Refer to the manual supplied with the processor to verify which bus and processor speeds are supported.
>
> Note that you must configure your operating system to use the second processor. Some operating systems do not support two processors.

1   Install any other accessories before completing the installation of the processor.

2   Replace the cover (see "Removing and Replacing the Cover" earlier in this chapter).

3   Turn on the computer and check that the new processor is recognized by the power-on system-test.

4 TROUBLESHOOTING YOUR PC AND USING THE SETUP PROGRAM

This chapter can help you solve problems that you may encounter when using your PC and describes how to use the HP Setup program.

SOLVING PROBLEMS

If you have a problem with your PC, search the list below for the problem description which most closely matches it. Then turn to the page indicated for guidance.

If Your PC Does Not Start

- If nothing appears on your display, see "If Your PC Does Not Start" in this chapter.

- If an error message appears:

  - If a System ROM message appears, see "If an Error Message Appears" in this chapter.

  - If a Power-On-Self-Test error appears, see "If an Error is Detected by the Power-On-Self-Test" in this chapter.

  - If a Power-On-Self-Test error prevents your PC from starting, see "If an Error is Detected by the Power-On-Self-Test" in this chapter.

  - If a BIOS message prevents your PC from starting, see "BIOS Error Messages that May Prevent Your PC From Starting" in this chapter.

  - If an Operating System message prevents your PC from starting, see "Operating System Messages that May Prevent Your PC From Starting" in this chapter.

If Your PC Has a Hardware Problem

- If your display does not work, see "If Your Display Does Not Work" in this chapter.

  - If you cannot set any video resolution higher than 640 5 480, see "If You Cannot Use Any Video Resoluton Higher Than 640 X 480" in this chapter.

- If your keyboard or mouse does not work, see "If Your Keyboard or Mouse Does Not Work" in this chapter.

- If your printer does not work, see "If Your Printer Does Not Work" in this chapter.

- If the flexible disk drive does not work, see "If the Flexible Disk Drive Does Not Work" in this chapter.

- If the hard disk does not work, see "If the Hard Disk Does Not Work" in this chapter.

  - If the hard disk activity light does not work, see "If the Hard Disk Activity Light Does Not Work" in this chapter.

- If an accessory board does not work, see "If an Accessory Board Does Not Work" in this chapter.

If Your PC Has a Software Problem

- If you have forgotten your passwords, see "If You Have Forgotten Your Password" in this chapter.

- If you can't start the Setup program, "If You Can't Start the Setup Program" in this chapter.

- If the date and time are incorrect, "If the Date and Time Are Incorrect" in this chapter.

If Your PC Has a Networking Problem

- Use the **HPVGSET** utility (provided on the "XU/VT Drivers and Documentation" CD-ROM) to troubleshoot your network adapter.

  The **HPVGSET** utility is described in the *Network Administrator's Guide* on the "XU/VT Drivers and Documenation" CD-ROM.

IF YOU CANNOT SOLVE THE PROBLEM

If you are unable to solve your problem after following the troubleshooting advice in this chapter, refer to chapter 6, *HP Support and Information Services,* for information on getting help from your HP Reseller or from your nearest HP Customer Support Center.

IF YOUR PC DOES NOT START

IF YOUR DISPLAY IS BLANK AND THERE ARE NO ERROR MESSAGES

1   Make sure that all cables and power cords are firmly plugged in.

2   Make sure the power outlet is working.

3   Check that the computer and display are turned on. (The power light should be illuminated.)

4   Check the display's contrast and brightness settings.

5   If the PC still does not work:

   a   Turn off the display, the computer, and all external devices.

   b   Unplug all power cords and cables, noting their positions.

   c   Remove the cover (refer to "Removing and Replacing the Cover" in chapter 3).

   d   Check that the processor is correctly installed (refer to "Installing a Processor" in chapter 3).

   e   Check that the memory modules are correctly installed (refer to "Installing Memory" in chapter 3).

   f   Check that accessory boards are firmly seated in their slots (refer to "Installing Accessory Boards" in chapter 3).

g   Verify that any switches and jumpers on the accessory boards are properly set (refer to the manuals that came with each board).

h   Check that the switches on the system board are properly set (refer to "System Connectors and Switches" in chapter 5).

i   Replace the cover (refer to "Replacing the cover After Installing Accessories" in chapter 3).

j   Connect all cables and power cords (refer to chapter 1).

k   Turn on the display and computer.

If your PC still does not start, remove all boards and accessories, except the hard disk drive. Start the PC. If the PC now works, add the boards and accessories one at a time to determine which one is causing the problem.

IF AN ERROR MESSAGE APPEARS

If a System ROM Message Appears

If the following system ROM error message appears:

```
Cannot display error messages
Flash ROM may be defective
```

the contents of the system ROM are corrupted or incomplete, and you will need to update the system BIOS using the HPInit utility.

Contact your HP reseller (or your HP sales office) to get an HPInit utility diskette and the latest system BIOS for your PC by mail.

NOTE	Please specify the model number of your HP Vectra PC when ordering the HPInit utility and the latest system BIOS.
	If you have access to a PC with a modem or network connection, which functions correctly, you can retrieve the latest system BIOS from one of the HP Information Services described in chapter 6, *HP Support and Information Services*.

To update the system BIOS:

1   Insert the HPInit utility diskette in drive A.

2   Switch the computer OFF and then ON, and follow the instructions until the procedure finishes. Do NOT switch off the computer until the system BIOS update procedure has completed (successfully or not) since irrecoverable damage to the ROM may occur.

3   Remove the HPInit utility diskette.

4   Switch the computer OFF and then ON to initialize the system ROM.

If an Error is detected by the Power-On-Self-Test

If an error is detected when the PC starts, the Error Message Utility (EMU) is launched.

- Follow the instructions provided by the EMU.

- If prompted by the EMU, press [F2] to run Setup and correct the error (refer to "Using the HP Setup Program" in this chapter for information on using Setup).

- Press [F1] to continue and ignore the error. (It is recommended that you fix the error before proceeding, even if the PC appears to start successfully.)

Corrective actions for errors that may prevent your PC from starting are described in the following table.

Power-On-Self-Test Errors that May Prevent Your PC From Starting:

`0130,`
`0241`
`0280`
	What you should do:
	1 Ensure the configuration stored in CMOS memory has not been cleared by the system board switch (refer to chapter 5).
	2 Run Setup to correct the configuration information.
	3 If all the above fail to correct the problem, the system board may need to be replaced. Contact your service representative.

`0250`	**What you should do:** 1 Run Setup and correct the errors highlighted by the Setup program. 2 Ensure the configuration stored in CMOS memory has not been cleared by the system board switch (refer to chapter 5). Make a written note of the configuration. 3 If the hardware was changed, run Setup to update the configuration information.
`06xx`	**What you should do:** 1 Ensure that nothing is pushing down on the keyboard, and that no key is stuck down. 2 If the problem persists, contact your service representative.

`61xx,`
`6500,`
`6510,`
`6520`
`8x06`
	What you should do:
	1 Ensure the memory modules are installed correctly (refer to chapter 3).
	2 If this does not fix the problem, initialize the system ROM (refer to "If You Can't Start the Setup Program" in this chapter on page 103).
	3 If the problem persists, the system board may need to be replaced. Contact your service representative.

`65xx,` `66xx`	**What you should do:** 1 Disable all shadowing with the Setup program. 2 If this fails to correct the problem, the system board may need to be replaced. Contact your service representative.
`8060`	**What you should do:** 1 Check that the hard disk drive has not been disabled with the Setup program. 2 Check that the disk power and data cables are correctly connected (refer to chapter 3).
`910B`	**Explanation:** 1 You connected the flexible disk drive connector B to the disk drive, and there is no connection to a drive A. 2 Change the flexible disk drive connector to A (refer to chapter 3).

BIOS Error Messages that May Prevent Your PC From Starting:

```
Cannot start from
hard disk (A new
drive may need to be
partitioned and
formatted).
```
```
For more information
refer to your
manual. To continue
without an explana-
tion, just press F1.
```
Explanation:
There is no operating system installed on your hard disk.

What you should do:
Install an operating system on the hard disk or insert a diskette with an operating system, and press any alphanumeric key to continue.

Refer to chapter 1 of this User's Guide for instructions on installing an operating system.

```
Insert system
diskette in drive.
```
```
Press any key to
continue.
```

Explanation:
- there is no operating system installed on your hard disk
- there is no operating system on the diskette in drive A
- the hard disk drive is disabled, or not present.

What you should do:
Install an operating system on the hard disk or insert a diskette with an operating system, and press any alphanumeric key to continue.

Refer to chapter 1 of this User's Guide for instructions on installing an operating system.

```
Boot program in
first sector of
diskette is invalid,
cannot start from
this diskette.
```
```
Cannot start from
hard disk.
```

Explanation:
There is a problem with the disk drive, or the disk drive is not properly formatted.

What you should do:
Insert a diskette with the proper operating system, and press any alphanumeric key to continue.

```
Missing operating
system
```

Explanation:
You tried to start the PC but the PC could not find the operating system.

What you should do:
Run Setup and make sure the hard disk has been correctly configured.

```
System boot process
failed. Press any
key to try again.
```

Explanation:
You tried to start the PC but the PC could not find the operating system.

What you should do:
- check the diskette contains the operating system
- check the hard disk contains the operating system
- ensure "start from the flexible disk" or "start from the hard disk" is enabled in Setup
- for a network, ensure "remote start" is enabled in Setup.

Operating System Messages that May Prevent Your PC From Starting:

`Non-system disk or disk error`

What you should do:

Remove the diskette, or replace it with the proper operating system diskette, and press any alphanumeric key to continue.

`Not ready error reading (or writing) drive x`

Explanation:

The device specified in the error message is not ready to accept or transmit data. This could occur if:

- The diskette has not been inserted correctly. If this is the problem, reinsert the diskette and type ''R'' (for Retry).
- The printer is not working—ensure it is on and ready to print.
- The device has been disabled using Setup.

IF YOUR PC HAS A HARDWARE PROBLEM

This section describes what to do if you have problems with your display, disk drives, printer, accessory boards, keyboard, or mouse.

IF YOUR DISPLAY DOES NOT WORK

If nothing is displayed on the screen, but the PC starts and the keyboard, disk drives, and other peripheral devices seem to operate properly:

1   Check that the brightness and contrast controls are properly set.

2   Make sure that the display is plugged in and switched ON.

3   Ensure that the display video cable is correctly connected to the display and to the PC.

4   Switch off the display, and unplug it from the power outlet. Examine the video cable pins to see if they are bent. If they are, carefully straighten them.

If the display image is not aligned with the screen (usually when you change resolutions), use the display's controls to center the image. Refer to the display manual for instructions.

If the screens generated by your software applications do not appear correct, check the application's manual to find out which video standard is required. Also check your display manual to find out which refresh rate is required. Use the HP User Tools (in Windows 95 only) or the Setup program to select the correct refresh rate.

If the display works correctly during the Power-On-Self-Test (POST), but goes blank when the operating system starts:

- Restart the PC and check that the amount of video memory detected by the POST is correct. If you have installed extra video memory and only 2 MB is detected, check that the video memory module is installed correctly on the video accessory board (see "Installing More Memory on the MGA Video Adapter" in chapter 3).

- If the video memory is correctly detected by the POST, follow the instructions below to correct the problem.

If You Cannot Use Any Video Resolution Higher Than 640 X 480

If you cannot select a video resolution higher than 640 X 480, you should clear the contents of the CMOS memory.

To clear the configuration:

1   Switch off the PC and remove the cover (refer to chapter 3 for instructions).

2   Set the system board switch 1 (CONFG) on the switch block to ON to clear the configuration from the CMOS memory (refer to "System Board Switches" in chapter 5 for the switch location).

3   Switch on the PC to erase the CMOS memory.

4   Check that error codes **0240** and **0130** are displayed by the Error Message Utility, and wait until the PC has started.

5   Switch off the PC.

6   Set the system board switch 1 (CONFG) on the switch block to OFF to re-enable the configuration.

7   Replace the cover (refer to chapter 3).

8   Switch on the PC and run Setup by pressing [F2] when **<Setup=F2>** appears. (Error code **0130** will appear when the PC starts.)

9   Press [F3] to save the configuration and exit from Setup.

IF YOUR KEYBOARD OR MOUSE DOES NOT WORK

1   Ensure that the keyboard or mouse is correctly connected.

2   Ensure that the mouse driver supplied with the preloaded software is installed correctly. (Choose a Logitech™ mouse driver for your operating system.)

3   Clean the mouse ball and rollers as shown in the figure below (use a non-residual contact cleaner).

Remove the mouse ball

Clean the mouse rollers

Clean the mouse ball
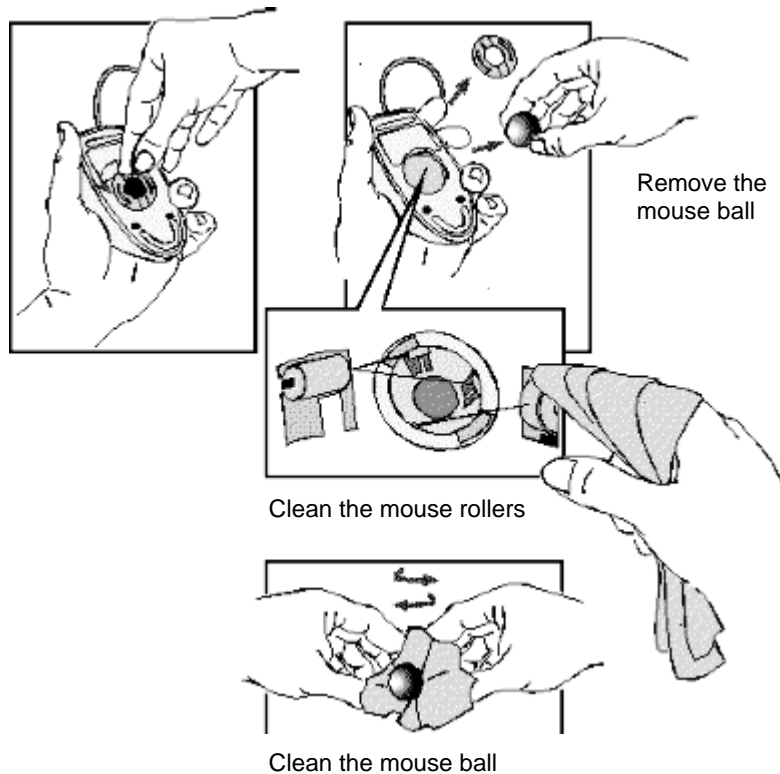
IF YOUR PRINTER DOES NOT WORK

1   Verify that the power cord is plugged into the power outlet and into the printer.

2   Make sure the printer's power switch is ON.

3   Check that the printer is on-line.

4   Examine the paper feed mechanism for a paper jam.

5   Verify that you have the correct cable for the printer. Make sure that it is securely connected to the correct connector (port) on the PC and printer.

6   Make sure that the printer is configured correctly for the PC and for the application.

   a   Ensure that the PC's port has been correctly configured with the Setup program.

   b   Make sure the printer is correctly set up for your operating system.

   c   Ensure the software application's "print" menu has been correctly set up. (Refer to the manual supplied with the software.)

7   Check that the PC's port is working properly by connecting another printer to the port.

8   If the printer displays an error message, refer to the printer's manual for help.

IF THE FLEXIBLE DISK DRIVE DOES NOT WORK

1   Ensure you are using a formatted diskette and it is inserted correctly.

2   Check you are using a diskette that is the right density. You should use only 1.44 MB High Density diskettes in drive A (High Density diskettes have a HD symbol printed on the diskette).

3   Check that the flexible disk drive has not been disabled in Setup (refer to "Using the HP Setup Program" in this chapter).

   a   There are two options in the **Security Features** section of Setup which may be used to disable or enable:
      • the flexible disk drives
      • writing to flexible disks.

   b   There is one option in the **Start-Up Center** which may be used to disable or enable:
      • start (boot) from flexible disks

4   Check that the disk power and data cables are correctly connected (refer to chapter 3).

5   Clean the flexible disk drive using a "wet-cleaning diskette kit" (this kit may be purchased from most resellers).

IF THE HARD DISK DOES NOT WORK

1   Check that the hard disk drive has not been disabled in Setup (refer to "Using the HP Setup Program" in this chapter).

   • There is an option in the **Security Features** section of Setup which may be used to disable or enable the hard disk drives

   • the **Start-Up Center** may be used to disable or enable starting from hard disk.

2   Check that the disk power and data cables are correctly connected (refer to chapter 3).

3   Check that power management has been correctly configured.

If the Hard Disk Activity Light Does Not Work

If the hard disk activity light does not flicker when the PC is accessing the hard disk drive:

1   Check that the control panel connector is firmly attached to the system board.

2   Check that the disk power and data cables are correctly connected (refer to chapter 3).

IF AN ACCESSORY BOARD DOES NOT WORK

Perform the following checks:

1   Ensure the board has been firmly installed in the accessory board slot (refer to chapter 3)

2   Ensure the board is not using memory, I/O addresses, an IRQ, or DMA also used by the PC. Refer to the board's manual for details.

3   Check that the PC has been configured correctly in Setup.

4   If the problem persists, contact the accessory board vendor.

IF YOUR PC HAS A SOFTWARE PROBLEM

IF YOU HAVE FORGOTTEN YOUR PASSWORD

- If you forget the User Password and the System Administrator Password is set and known:

  1   Restart the PC. If the keyboard is locked, unplug the power cord and plug it in again.

  2   Wait for the message `<F2=Setup>`.

  3   Press [F2] to start Setup.

  4   Type the *System Administrator Password* to enter Setup.

  5   Highlight the User Password field and set a new User Password.

  6   Press [F3] to save the new User Password and exit Setup.

- If you forget both the User Password and the System Administrator Password:

  1   Switch off the PC.

  2   Remove the computer's cover (refer to chapter 3).

  3   Set switch 2 (PSWRD) on the system board switch block to ON (refer to chapter 5 for the switch location).

  4   Switch on the PC and allow it to complete its startup routine.

  5   Switch off the computer.

  6   Reset switch 2 (PSWRD) to OFF.

  7   Replace the computer's cover (refer to chapter 3).

  8   Switch on the PC and allow it to complete its startup routine.

  9   Press [F2] when prompted to use Setup.

  10 Set new User and System Administrator Passwords.

  11 Press [F3] to save the new passwords and exit Setup.

IF YOU CAN'T START THE SETUP PROGRAM

This may happen if the copy of the PC's configuration stored in memory is corrupted. You will need to erase this bad configuration.

To clear the configuration:

1   Switch off the PC and remove the cover (refer to chapter 3).

2   Set the system board switch 1 (CONFG) on the switch block to ON to clear the configuration (refer to "System Connectors and Switches" in chapter 5 for the switch location).

3   Switch on the PC to erase the memory.

4   Check that error codes **0240** and **0130** are displayed, and wait until the PC has started.

5   Switch off the PC.

6   Set the system board switch 1 (CONFG) on the switch block to OFF to re-enable the configuration.

7   Replace the cover (refer to chapter 3).

8   Switch on the PC and run Setup by pressing [F2] when **<Setup=F2>** appears. (Error code **0130** will appear when the PC starts.)

9   Press F[3] to save the configuration and exit from Setup.

IF THE DATE AND TIME ARE INCORRECT

The date and time can be incorrect for the following reasons:

*   the time has changed for the seasons

*   the PC has been unplugged from the power too long, and the Gold Capacitor which supplies power to the CMOS memory has discharged.

Use the Setup program to change the date and time.

IF YOUR PC HAS AN AUDIO PROBLEM

No Sound When Running Any Applications

First, check that the output volume is not set to zero. Use the volume control on the front panel. Make sure the headphones are not connected directly to the CD-ROM drive (see the connection information in chapter 1).

Remember also that plugging the headphones into the front panel cuts out sound to the internal speaker and to external speakers connected to the audio Stereo Out jack.

When your PC starts up, the integrated audio interface may have no IRQ or DMA settings. These settings are initialized by software upon startup. Your system files may not have the necessary entries. Run the Setup program to configure the IRQ and DMA settings.

Absence of sound can also be caused by a hardware conflict. Hardware conflicts occur when two or more peripheral devices compete for the same signal lines or channels. Conflicts between your audio interface and another peripheral device might be due to the settings of the I/O addresses, IRQ channel, or DMA channel. To resolve the conflict, change the settings either of the audio interface or of any other ISA accessory in your system.

No Output from the 8-bit or 16-bit Digitized Sounds

This might be due to the DMA channel selected. If you hear no output from both the 8-bit and 16-bit digitized sounds, this might be due to an interrupt conflict. Use the HP Setup program or your operating system's audio control software to change the audio interface's DMA channel or IRQ setting.

The Volume is Too Low

The computer has two output jacks, Stereo Out on the rear of the computer and a headphones jack on the front panel, which provide the same output signal. This is a low-distortion output that cannot drive (without amplification) low-impedance devices such as speakers. If you plug devices with a low-impedance (less than 32 ohms) into the Stereo Out jack or the headphones jack, the volume will be low.

Audio Input from the Microphone is Too Low, or No Audio At All

Check that the microphone specifications meet the requirements of the 16-bit sound components. The microphone should be a 600-ohm dynamic type.

Humming Noise

If the power grounding of your audio components is inadequate, a humming noise may be generated. This may happen if your PC is connected to a hi-fi system. Plug all devices into adjacent power outlets (outlets within 5 cm / 2 inches of each other), or use line filters.

Occasional Crackles When Playing Back Sounds

These crackles are usually the result of your PC being unable to transfer audio samples within the required time. A solution is to use a lower sampling rate. Recording and playing back at 22 kHz is less demanding upon system resources than recording audio at 44 kHz.

The PC Hangs While Recording

Uncompressed digital audio can eventually fill your hard disk. For example, one minute of stereo sound recorded at a resolution of 44 kHz will occupy about 10.5 MB. Before recording, check that there is enough free space on your hard disk.

Data compression can reduce the space required. The A-law and m-law hardware compression used by the audio interface enables the sampling of sound at a resolution of 16-bits, but it generates the same quantity of data as an 8-bit sample.

MS-DOS Games Give "Not enough memory" Errors

Many games require a large amount of base memory and may not execute if many drivers or TSR (Terminate and Stay Resident) programs are installed. You may solve this problem by loading device drivers and TSRs into high memory. Refer to your MS-DOS manual for details of how to do this.

IF THE CD-ROM DRIVE HAS A PROBLEM

Check that the software is correctly installed and the system correctly configured *before* removing your computer's cover to check the CD-ROM cable connections and jumper settings.

No Sound from the CD-ROM Drive

If you are having problems with sound when playing a CD:

- Check that the volume control (if present) on the CD-ROM drive front panel is not set to the minimum.

• Ensure that the disk in the CD-ROM drive is an audio disk and not a Photo CD or data CD.

• If using headphones or external speakers, check that they are properly connected (see chapter 1).

• Check that the CD audio cable is correctly installed and is connected to the system board.

CD-ROM Drive is Idle

If the CD-ROM drive does not appear to be working, try accessing the disk by clicking on the CD-ROM drive icon or drive letter assigned to the CD-ROM drive by your operating system.

> **WARNING:** **Be sure to disconnect the power cord from your computer before you remove the cover to check the cable connections or jumper settings.**

USING THE HP SETUP PROGRAM

Setup is an integrated (ROM-based) program that displays the PC's configuration. Configuration information for associated PC features is grouped together to make it easier to find.

Check the configuration when you first use the PC and each time after you install, remove, or upgrade accessories.

> **NOTE** If you are unable to change the PC's configuration, check that you entered the correct password when you started Setup.

STARTING THE SETUP PROGRAM

1 Turn on the PC and the display.

   If the PC is already turned on, save your data and exit all programs, then press [CTRL] [ALT] and [DELETE] to restart the PC.

2 Press [F2] while **<Setup=F2>**is displayed on the screen.

<Setup=F2>
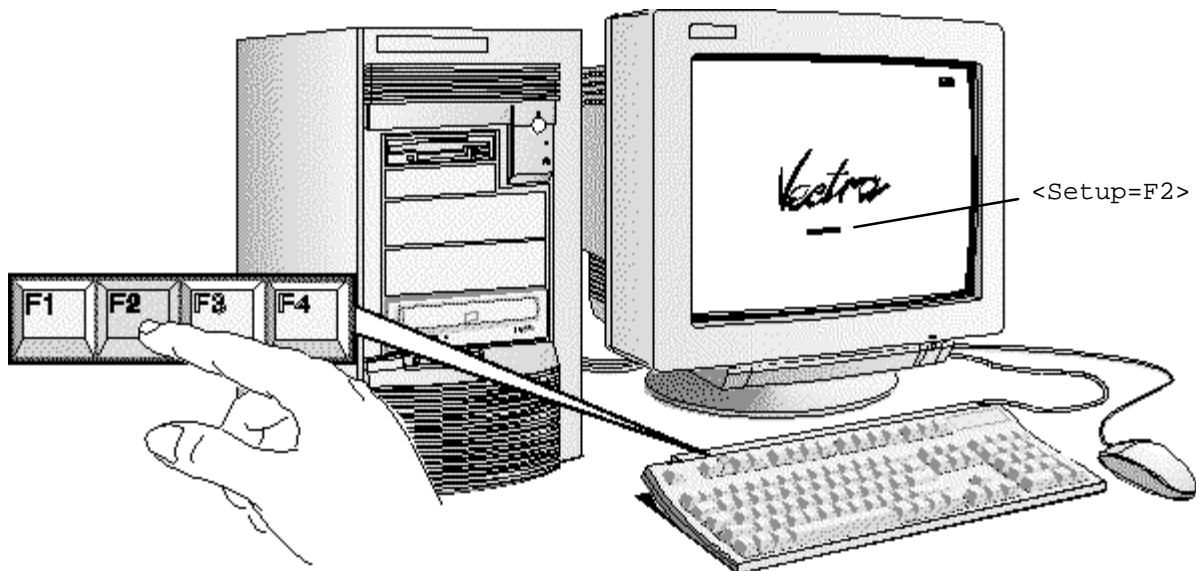
`<Setup=F2>` appears for only a few seconds, just after the beeps signalling the end of the self-test.

3   The PC's Setup program will appear.

```
System BIOS (Version x.xx.xx)
Video Adapter (MGA Millenium 2 MB, Video BIOS version xx.xx)
System Board (Pentium™) Pro, XXX MHz)
Memory (xx MB, 640 KB base, 384 KB Reserved, XX Ext.)
Hard Disk Drives (No IDE disk detected)
LAN (100VG, MAC address: 1234567890)
```

• To change a setting, move the highlight to the desired line and follow the instructions on the bottom of the screen.

• Use the ↑ or ↓ keys to move the highlight from one line to another.

• Use the [F7] or [F8] key to display available values.

• Use the [NUM LOCK] key to set the numeric keypad to cursor control or numerics.

• Use the [HOME] key to display the first Setup screen.

• Use the [F1] key to display help (press it again to turn the help off).

• Use the [F3] key to save your settings and exit Setup.

• Use the [F10] key to print the Setup configuration.

• Use the [F12] key to exit Setup without saving any changes.

UNDERSTANDING THE SETUP PROGRAM

This section of the book only explains the important Setup options that are not described elsewhere in this *User's Guide*.

The built-in Setup program is accessed by pressing [F2] during the PC's Power-On-Self-Test. For more information about Setup options, highlight an option and press [F1] for context-sensitive online help. If you have a printer connected to your computer, press [F10] to print out the current Setup configuration.

NOTE	The Setup options displayed on your screen may be different from those described here.

Viewing the Configuration Screen

This screen provides information about your computer's configuration. These items are for information only and cannot be changed.

```
       Setup (Version x.xx.xx)              F1=Help On/Off

System BIOS (Verxion x.xx.xx)
Video (MGA Millenium 2 MB, Video BIOS version xx.xx)
System Board (Pentium™) Pro, XXX MHz)
Memory (xx MB, 640 KB base, 384 KB Reserved, XX Ext.)
Hard Disk Drives (No IDE disk detected)
LAN (100VG, MAC address: 1234567890)
```

Optimizing the System BIOS

Highlight the **Operating System** option and select the name of the operating system installed on your computer. The system BIOS will be optimized for your operating system.

```
Date (Year/Month/Day)  . . . . . . . . . 1995 / 01 / 01
Time (Hour/Minute/Second)  . . . . . . . 09 : 35 : 53
Operating System . . . . . . . . . . . . Microsoft Windows NT
```

Changing User Preferences

Some of the User Preferences options will not be available if you have selected **Operating System . . Windows 95**.

Highlight the **Keyboard Power On** option and select **Enabled** if you want to use the space bar on your keyboard to switch on your computer.

```
User Preferences
  User Password . . . . . . . . . . . Not Set/Set
  Keyboard Lock Timer . . . . . . . Disabled/Enabled
  Screen Blanking . . . . . . . . . Enabled/Disabled
  Key Autorepeat Speed  . . . . . . 2 to 30 per second
  Delay before Autorepeat . . . . . 0.25 to 1 second
  Power-on Numlock State  . . . . . Not Set/Set
  Keyboard Power On . . . . . . . . Disabled/Enabled
  Memory Test . . . . . . . . . . . Disabled/Enabled
```

To speed up the computer's power-on self-test, highlight **Memory Test** and select **Disabled**

Viewing Processor Information

These lines provide information about the processor installed in your computer (and cannot be changed).

```
Processor . . . . . . . . . . . . . Pentium Pro
Computer Speed  . . . . . . . . . . 150 MHz
Coprocessor . . . . . . . . . . . . Integrated
```

Viewing Memory Size

Check that Setup has detected the memory and configured the Memory Size fields correctly. Check the TOTAL memory size and, if it is wrong, check that you have installed the memory modules correctly.

```
Memory Size       (1 MB = 1024 KB)
  Base, on System Board . . . . . . 640 KB
  Base, on Accessory Board  . . . . 0 KB
  Base, TOTAL . . . . . . . . . . . 640 KB
  Reserved  . . . . . . . . . . . . 384 KB
  Extended  . . . . . . . . . . . . 13312 KB      (13.0 MB)
  TOTAL . . . . . . . . . . . . . . 14336 KB      (14.0 MB)

Memory Hole Below 1 MB  . . . . . . Base = D400h, D800h
```

Configuring IDE Devices

Most IDE devices (for example, hard disk drives and CD-ROM drives) are automatically detected by the Setup program. If your IDE hard disk has more than 1023 cylinders, highlight **Translation Method** and select:

• **Automatic** if you use MS-DOS, Windows NT, Windows 95 or OS/2
• **Extended CHS** if you use NetWare
• **Standard CHS** if you use UNIX or Banyan Vines.

If no devices are installed on the second IDE channel, you should highlight Secondary Integrated Channel and select Disabled. This will make more system resources available for other system components.

```
IDE Primary Channel
  Device 1 . . . . . . . . . . . . 840 MB
  Device 2 . . . . . . . . . . . . None or SCSI
  Data Transfer Speed  . . . . . . Optimized
  Translation Method . . . . . . . Standard CHS/Ext. CHS/Auto
  Primary Integrated Channel . . . Enabled/Disabled

IDE Secondary Channel
  Device 1 . . . . . . . . . . . . CD-ROM
  Device 2 . . . . . . . . . . . . None or SCSI
  Data Transfer Speed  . . . . . . Optimized
  Translation Method . . . . . . . Standard CHS/Ext. CHS/Auto
  Secondary Integrated Channel . . Enabled/Disabled
```

Configuring the SCSI Interface

If you install a SCSI host adapter board, highlight the **Integrated Interface** option and select **Disabled**.

```
Integrated SCSI Interface
  Integrated Interface  . . . . . . Enabled/Disabled
  SCSI BIOS . . . . . . . . . . . . Not Available/Enabled
  Ultra SCSI  . . . . . . . . . . . Automatic/Enabled/Disabled
```

Do not change the **Ultra SCSI** option from **Automatic** unless you are familiar with the restrictions of Ultra SCSI. To access advanced SCSI device configuration options, restart the computer and press [F7] when <SCSI Setup=F7> is displayed.

Flexible Disk Drives

If you install a flexible disk drive that uses the integrated disk interface, the Setup program should detect and configure the drive automatically.

If you have two flexible disk drives, highlight Bootable Drive and select Drive 1 or Drive 2. This is the drive your computer will use to start (boot) from a system diskette.

```
Flexible Disk Drives
  Drive 1 . . . . . . . . . . . . . 3.5-inch, 1.44 MB
  Drive 2 . . . . . . . . . . . . . None
  Bootable Drive  . . . . . . . . . Drive 1
  Interface . . . . . . . . . . . . Integrated/Controller Board
```

If you install a flexible disk drive that has its own controller board, highlight the Interface option and select Controller Board. Configure the controller as described in its manual.

Security Features

Some of the Security Features options will not be available if you have selected **Windows 95 … Installed**.

```
Security Features
   System Administrator Password . . Not Set
   Start with Keyboard Locked  . . . Enabled/Disabled
   Flexible Disk Drives  . . . . . . Enabled/Disabled
   Writing on Flexible Disks . . . . Allowed/Not Allowed
   Plug and Play Device Management . Full/None/Required for Boot
```

Using the Start-Up Center

The Start-Up Center lets you choose which system devices the computer can start (boot) from. Some options will not be available if you selected **Operating System … Microsoft Windows NT, OS/2**, or **Other**.

```
Start-Up Center
   Control
      Start from Flexible Disk  . . . Enabled/Disabled
      Start from Hard Disk  . . . . . Enabled/Disabled
      Bootable HDD Interface  . . . . IDE/SCSI
      Start from Network  . . . . . . Enabled/Disabled

   Priority Selected
   Priority of available devices . . 1  Flexible Drive
                                   . . 2  IDE Hard Drive
                                   . . 3  SCSI Hard Disk
                                   . . 4  Network
```

The **Priority Selected** items are for information only and cannot be changed.

Parallel Ports and Serial Ports

Use these options to select a combination of I/O address and IRQ channel for the parallel port and for the serial ports.

To configure a parallel port mode, highlight **Parallel Port Mode** and select **Centronics, EPP,** or **ECP**.

```
Parallel Port . . . . . . . . . . . Parallel 1 (378h, IRQ7)
Parallel Port Mode  . . . . . . . . Centronics/EPP/ECP

Serial Port A . . . . . . . . . . . Serial 1/2/3/4/Off
Serial Port B . . . . . . . . . . . Serial 1/2/3/4/Off
```

NOTE	These options may not be available if Windows 95 is installed on your computer.

Configuring Audio

Use these options to reserve system resources for the computer's integrated SoundBlaster™ audio interface.

If you do not want to use the audio interface, you should highlight the Audio Interface option and select Disabled. This will make more system resources available for other system components.

```
Audio
  Audio Interface . . . . . . . . . Enabled/Disabled
  Base I/O Address  . . . . . . . . 220/240/260/280
  IRQ Channel . . . . . . . . . . . 5/7/10
  8-bit DMA Channel . . . . . . . . 1/3
  16-bit DMA Channel  . . . . . . . 5/7
  MIDI Port base I/O address  . . . 330h/300h
  Joystick/Game Port  . . . . . . . Enabled/Disabled
```

Configuring the Video Adapter

Most of these video options are preconfigured for optimal video performance.

If your display is "Plug and Play" (supports Display Data Channel), highlight **Plug and Play Display** and select **Enabled**.

```
Video
    Plug and Play Display . . . . . . On/Off
```

If you install more video memory, ensure that the Setup program detects it and configures the **Video Memory** size correctly. If it is wrong, check that the memory module is installed correctly.

Selecting the IRQs Used by Accessory Boards

If you have installed an ISA accessory board that uses IRQ 9, 10, 11, or 15, you must highlight the **IRQ** *x* line and select **Used by an ISA Board**. This allows PCI devices to be automatically configured. You should always leave at least one IRQ free for use by the installed PCI devices.

```
IRQ Map for Accessory Boards
  IRQ 9  . . . . . . . . . . . . . Used by an ISA Board
  IRQ 10 . . . . . . . . . . . . . Available for PCI
  IRQ 11 . . . . . . . . . . . . . Available for PCI
  IRQ 12 . . . . . . . . . . . . . Available for PCI

IRQ 12 used for  . . . . . . . . . Mouse/Accessory Board
```

IRQ 12 is used by the mouse. If you do not use a mouse, IRQ 12 can be used by accessory boards.

Viewing the PC Serial Number

If your computer supports a Serial Number, it can viewed here.

```
PC Serial Number . . . . . . . . . Not Available/1234567890
```

USING THE SCSISELECT UTILITY

> **WARNING:** The *SCSISelect* utility is intended for advanced users only. Note that the SCSISelect options displayed on your screen may be different from those described here.

The *SCSISelect* utility is accessed by pressing [F6] when prompted during the PC's start-up process.

Viewing the Options menu

When you run the SCSISelect utility, the Options menu is displayed.

```
                    SCSISelect™ Utility v1.00


    Would you like to configure the interface, view
    configuration tips, or run the SCSI disk utilities?
    Select the option and press <Enter>. Press <F5> to
    switch between color and monochrome modes.

                          Options
              Configure View Interface Settings
                     SCSI Disk Utilities



 Arrow keys move cursor  <Enter> to select option. <Esc> to exit
```

Use the ↑ and ↓ keys and the [ENTER] key to make selections in the SCSISelect utility. Press [ESC] at any time to return to the previous menu.

Configure/View Interface Settings Menu

We recommend that these settings are not changed.

```
                   SCSISelect™ Utility v1.00

    Configuration

    SCSI Channel Interface Definitions
        Interface SCSI ID . . . . . . . . . . 7
        SCSI Parity Checking  . . . . . . . . Enabled

    Additional Options
        SCSI Device Configuration . . . . . . Press <Enter>
        Advanced Configuration Options  . . . Press <Enter>

            <F6> - Reset to Interface Defaults

 Arrow keys to move cursor, <Enter> to select option, <Esc> to exit
```

SCSI Channel Interface Definitions:

- **Interface SCSI ID**

  Changes the interface SCSI ID from its default value of 7 (which has the highest priority on the SCSI bus).

- **SCSI Parity Checking**

  Enable or disable host adapter SCSI parity checking. You should disable SCSI Parity Checking if any attached SCSI devices do not support SCSI parity (most currently available SCSI devices do support SCSI parity).

Additional Options:

- **SCSI Device Configuration**
  Press [ENTER] to display the SCSI Device Configuration menu.

- **Advanced Configuration Options**
  Press [ENTER] to view the Advanced Configuration Options menu.

SCSI Device Configuration Menu

This menu lets you configure parameters for each SCSI device on the SCSI bus. To configure a specific SCSI device, you need to know which SCSI ID it uses.

```
                    SCSISelect™ Utility v1.00

                    SCSI Device Configuration

SCSI Device ID              #0   #1   #2   #3   #4   #5   #6   #7
Initiate Sync Negotiation   yes  yes  yes  yes  yes  yes  yes  yes
Maximum Sync Transfer Rate  10.0 10.0 10.0 10.0 10.0 10.0 10.0 10.0
Enable Disconnection        yes  yes  yes  yes  yes  yes  yes  yes

   Options Listed Below Have NO EFFECT if the BIOS is Disabled

Send Start Unit Command     no   no   no   no   no   no   no   no
Include in BIOS Scan        yes  yes  yes  yes  yes  yes  yes  yes


Arrow keys to move cursor, <Enter> to select option, <Esc> to exit
```

Use the ↑ and ↓ keys to move between options. Press [ENTER] to display a menu with a selection of values.

- **Initiate Sync Negotiation**
  Some older SCSI-1 devices do not support synchronous negotiation. Set Initiate Sync Negotiation to No for these devices.

- **Maximum Sync Transfer Rate**
  Certain older SCSI-1 devices do not support Fast SCSI data transfer rates (typically 10.0, 8.0, and 6.7). Select a Maximum Sync Transfer Rate of 5.0 for these devices.

- **Enable Disconnection**
  To optimize SCSI bus performance, Enable Disconnection should be set to Yes when two or more SCSI devices are connected to the host adapter. Set Enable Disconnection to No to achieve slightly better performance when only one SCSI device is connected to the SCSI bus.

- **Send Start Unit Command**
  This option is not supported by some SCSI devices. Some SCSI devices require a jumper to be changed before they can respond to this command.
  When set to **Yes** this option reduces the load on your computer's power supply by allowing the interface to power-up SCSI devices one-at-a-time when you start your computer.
  When set to No each SCSI device powers up at the same time.

- **Include in BIOS Scan**
  When this option is set to **Yes** the interface BIOS supports devices attached to the SCSI bus without the need for device driver software. This option is valid only if the interface BIOS is enabled.

```
                    SCSISelect™ Utility v1.00

                 Advanced Configuration Options

SCSI Bus Reset at Interface Initialization          Enabled

    Options Listed Below Have NO EFFECT if the BIOS is Disabled

Interface BIOS                                           Enabled
Support Removable Disks Under BIOS as Fixed Disks        Boot Only
Extended BIOS Translation for DOS Drives > 1 GByte       Enabled
BIOS Support for More Than 2 Drives (MS-DOS 5.0 and above)  Enabled



Arrow keys to move cursor, <Enter> to select option, <Esc> to exit
```

- **SCSI Bus Reset at Interface Initialization**
  SCSI Bus Reset at Interface Initialization should always be enabled. When set to **Enabled** (and the interface BIOS is enabled), the SCSI bus is reset the first time the interface is initialized and the host adapter waits two seconds before scanning the SCSI bus for SCSI devices. There is no two second delay when **Disabled** is selected.

- **Interface BIOS**
  The Interface BIOS is enabled by default.

- **Support Removable Disks Under BIOS as Fixed Disks**
  When **Boot Only** is selected, only the removable media drive designated as the boot device is treated as a hard disk drive.
  If **All Disks** is selected, all removable-media drives supported by the BIOS are treated as hard disk drives.
  No removable-media drives are treated as hard disk drives when **Disabled** is selected.

- **Extended BIOS Translation for DOS Drives >1 GByte**
  This option is enabled by default with the following translation schemes:

  - SCSI hard disks $\leq$ 1 GByte use a translation scheme of 64 heads, 32 sectors per track

  - SCSI hard disks > 1 GByte use a translation scheme of 255 heads, 63 sectors per track.

- **BIOS Support for More Than 2 Drives**
  This option is only available if the interface BIOS is enabled. It lets you enable or disable BIOS support for between two to eight SCSI hard disk drives. This feature is supported by DOS 5.0 and above.

SCSI Disk Utilities

When the SCSI Disk Utilities are selected from the Options menu, the SCSISelect utility scans the SCSI bus and lists all the SCSI devices on the SCSI bus. Use the ↑ and ↓ keys to highlight a device and press [ENTER] to display the **Format Disk/Verify Media** menu.

- **Format Disk**
  This utility can be used to perform a low-level format of a hard disk. Most SCSI disks are preformatted and do not need low-level formatting.

- **Verify Disk Media**
  This utility scans for media defects on the selected SCSI device. Press the [ESC] key to abort this utility.

IF THE SCSI HARD DISK STOPS WORKING

If the SCSI subsystem has been operating properly for a reasonable length of time, and if no specific errors appear on the display, the problem may be due to equipment failure. The problem may also be due to some recent change you have made to the system.

1   If you have made recent changes to the software, such as changes to configuration files or drivers, this could cause the problem. Refer to the software documentation for more information.

2   If you have installed a board, ensure there is not a resource conflict between the new board you have added and existing boards. If you have changed the options on an existing board there may be a resource conflict:

   a   Remove the new board and restart the computer. If this corrects the problem, the board is either defective, or it is trying to use a system resource used by the SCSI subsystem. Change the board's settings as needed.

   b   Check that the new board is not using memory, I/O addresses, an IRQ, or DMA also used by the SCSI subsystem. Refer to the board's and SCSI subsystem manuals for more information.

3   Check the SCSI cable for problems that may have been caused by recent computer maintenance, hardware upgrades, or physical damage.

4   If you suspect hardware failure and there are no system error messages, check each component associated with the failure. Equipment failure, however, is the most unlikely reason for a SCSI subsystem failure.

IF YOU LOSE THE KEY

If you lose the key to the PC, you need to order a replacement lock (HP part number 5062-5590) from the HP dealer or HP Sales and Service Office. The new lock is delivered with two keys. Contact your HP dealer for installing the new lock.

5 TECHNICAL INFORMATION

This chapter provides technical information about your PC.

SYSTEM SPECIFICATIONS

Features and Characteristics

Feature:	Description:
Processor (standard)	Pentium Pro
Cache Memory (integrated in processor package)	• Level-One: 8 KB code, 8 KB data • Level-Two: 256 KB
Main memory (size/speed)	Upgradeable to 256 MB (ECC memory modules)
Video	64-bit Ultra VGA Controller on PCI accessory board 2MB standard, upgradeable to 4 MB, DDC2B compliant
LAN	Ethernet 10/100VG LAN controller on PCI accessory board
Audio	SoundBlasterTM 16 audio interface on the ISA bus
Disk drive controller	Ultra SCSI controller on PCI bus (supporting SCSI-2 Fast-20) Enhanced IDE controller on PCI bus (IDE Bus Master)
Rear connectors	• mini-DIN mouse • mini-DIN keyboard • 25-pin parallel • 9-pin serial (two, buffered) • Joystick/MIDI • Stereo In jack (3.5 mm) • Stereo Out jack (3.5 mm) • SCSI-2 (high-density connector)
25-pin parallel connector	• Mode: Centronics or bidirectional modes (ECP/EPP) • Parallel port: 1 (378h, IRQ 7), 2 (278h, IRQ 5), or Off.

9-pin serial connectors	• Standard: Two UART 16550 buffered serial ports (both RS-232-C).
	• Serial port:
	  • Serial Port A: 3F8h (IRQ 4), 3E8h (IRQ 4), or Off
	  • Serial Port B: 2F8h (IRQ 3), 2E8h (IRQ 3), or Off

Disk drive shelves	Seven mass storage shelves supporting: • two front-access, third-height, 3.5-inch drives • three front-access, half-height, 5.25-inch drives • two internal 3.5-inch hard disk drives
System board connectors	• One flexible disk drive connector • Two Enhanced IDE connectors (for up to 4 IDE devices) • One SCSI-2 connector (for up to 7 SCSI devices) • One wavetable connector (for wavetable accessory board) • One CD-ROM audio connector • One external start connector

Feature:	Description:
Accessory slots	Three 32-bit PCI slots, one combo ISA/PCI slot, two 16-bit ISA slots
Keyboard/Mouse	HP keyboard with mini-DIN connector
	HP mouse with mini-DIN connector

Characteristics:	Description:
Weight (excluding keyboard and display)	15 kilograms (33 pounds).
Dimensions	40.5 cm (D) by 21 cm (W) by 41.5 cm (H) (15.95 inches by 8.27 inches by 16.34 inches).
Footprint	0.085 m2 (0.91 sq ft).
Storage temperature	-40 °C to 70°C (-40 °F to 158 °F).
Storage humidity	8% to 80% (relative).
Operating temperature	5 °C to 40 °C (40 °F to 104 °F).
Operating humidity	15% to 80% (relative).
Acoustic noise emission	< 40 db in the workplace under normal conditions as defined by DIN 45635 T.19 and ISO 7779.
Power supply	• Input voltage: 100-127 V ac, 200-240 V ac (switch-selectable) • Input frequency: 50/60Hz • Maximum power: 280 W continuous.

AUDIO FEATURES

Feature:	Description:
Digitized Sounds	• Sound Blaster 16, General MIDI, MPC2 Compliant • Compatible with AdLib FM • 16-bit and 8-bit stereo sampling from 5 kHz to 44.1 kHz • 8-bit DMA transfer on channel 1 or 3, 16-bit DMA transfer on channel 5 or 7 • 8-bit ADPCM decompression in hardware (2:1, 3:1, and 4:1) • 16-bit software-based real-time audio compression/ decompression system with the following standards: Creative ADPCM (16:4), CCITT A-law (16:8), CCITT m-law (16:8) • Automatic dynamic filtering for digital audio recording and playback
Music Synthesizer	• 20-voice enhanced OPL3 FM music synthesis using four operators • 4 operator mode with 6 melodies and 5 percussions or 2 operator mode with 15 melodies and 5 percussions • Wavetable upgrade option for orchestral, 32-voice polyphony (16-bit wave-sample synthesis)

Audio Features (contd.)

Feature:	Description:
Mixer	• Output mixing of all audio sources: digitized sounds, FM music, microphone, line in, CD audio, and PC speaker • Input mixing sources: FM music, microphone, Stereo In, CD audio, and PC speaker • Multiple source recording and Left/Right channels swapping or mixing • 8-level volume control for digitized sounds, FM music, microphone, Stereo In, CD audio, and master volume • 4-level volume control for PC speaker
Built-in Power Amplifier	• One watt with eight ohms speaker
MIDI Interface	• Built-in MIDI interface for connection to external MIDI devices • Sound Blaster and MPU-401 UART mode compatible • MIDI time-stamp for multimedia extension • Input buffer: 64-byte FIFO
Microphone Input	• Automatic Gain Control (AGC) amplifier or fixed gain amplifier • Input impedance: 600 ohms • Sensitivity: 30 mVpp to 200 mVpp
Headphones Jack/Stereo Out Jack	• Impedance: 32 ohms
Sound Codec	• High-performance, 16-bit stereo ADC/DAC • 64 times over-sampling Delta-Sigma technology • 85-dB dynamic range • On-chip digital anti-aliasing and interpolation filters

POWER CONSUMPTION INFORMATION

Full Power mode	**280 W**
Off	< 3 W* * The power supply in your Vectra PC continues to supply power to the CMOS memory, even when switched off.

NOTE	When the PC is turned off with the power button on the front panel, the power consumption falls below 5 Watts, but is not zero. The special on/off method used by this PC considerably extends the lifetime of the power supply. To reach zero power consumption in "off" mode, either unplug the PC from the power outlet or use a power block with a switch. You should be aware that, in this case, the PC will lose its time settings within a few days.

Typical Power Consumption/Availability for ISA Accessory Slots

+5 V	1 A limit per slot (limited by system board)
+12 V	0.2 A limit per slot (limited by system board)
- 5 V	0.2 A total power limit (limited by power supply)
-12 V	0.5 A total power limit (limited by power supply)

Typical Power Consumption/Availability for PCI Accessory Slots

+3.3 V	2.5 A maximum per slot
+5 V	2.5 A maximum per slot
+12 V	0.2 A maximum per slot
-12 V	0.2 A maximum per slot

There is a maximum per-slot limit of 15 W between all supply rails.

THE PC'S MEMORY MAP

Memory Area	Memory Range	Hexadecimal Address Range	Used By
Extended Memory: 1 MB to 256 MB			
Extended memory	1024 KB upward	01000 to 0F0000	Windows Applications
Conventional Memory: 0 KB to 1024 KB (1 MB)			
384 KB Reserved Memory Area	960 KB to 1024 KB	0F0000 to 010000	64 KB BIOS area
	896 KB to 960 KB	0E0000 to 0F0000	64 KB (available)
	800 KB to 896 KB	0C8000 to 0E0000	96 KB available for accessory boards
	768 KB to 800 KB	0C0000 to 0C8000	32 KB Video BIOS Area
	640 KB to 768 KB	0A0000 to 0C0000	128 KB Video Memory Area
640 KB Base Memory Area	0 KB to 640 KB	09F000 to 0A0000	Extended BIOS Data Area
		—	User Application Area
		—	MS-DOS Operating System
		0500 to 0700	MS-DOS Temp Buffer
		0400 to 04FF	BIOS Data Area
		0000 to 03FF	Interrupt Vector Table

IRQS, DMAS, AND I/O ADDRESSES USED BY YOUR PC

The IRQ, DMA, and I/O address mappings shown here are for a PC with a basic configuration. The resources used by your PC may vary, depending upon which accessory boards are bundled with the PC.

IRQs used by PC		
	IRQ0	system timer
	IRQ1	keyboard
	IRQ2	system cascade
	IRQ3	free if not used for serial port
	IRQ4	free if not used for serial port
	IRQ5	free if not used for parallel port or audio
	IRQ6	flexible disk drive controller
	IRQ7	free if not used for parallel port or audio
	IRQ8	real-time clock
	IRQ9	available for PCI, if not used by ISA board
	IRQ10	available for PCI, if not used by ISA board or audio
	IRQ11	available for PCI, if not used by ISA board
	IRQ12	free if the mouse is disabled in SETUP
	IRQ13	processor
	IRQ14	integrated IDE controller
	IRQ15	available for PCI, if not used by ISA board

DMAs used by PC	
	DMA 0 free
	DMA 1 free if not used for parallel port or audio
	DMA 2 flexible disk drive controller
	DMA 3 free if not used for audio
	DMA 4 used to cascade DMA channels 0-3
	DMA 5 free if not used for audio
	DMA 6 free
	DMA 7 free if not used for audio

I/O Addresses used by PC	170h - 177h	integrated IDE controller (secondary channel)
	1F0h - 1F7h	integrated IDE controller (primary channel)
	220h - 22Fh	SoundBlaster audio
	278h - 27Fh	parallel port 2
	2E8h - 2EFh	serial port 4
	2F8h - 2FFh	serial port 2
	300h - 301h	MPU-401 MIDI interface
	330h - 331h	MPU-401 MIDI interface
	376h	integrated IDE controller (secondary channel)
	377h	integrated flexible disk controller
	378h - 37Fh	parallel port 1
	388h - 38Bh	music controller
	3E8h - 3EFh	serial port 3
	3F0h - 3F5h	integrated flexible disk controller
	3F6h	integrated IDE controller (primary channel)
	3F7h	integrated flexible disk controller
	3F8h - 3FFh	serial port 1

AVAILABLE VIDEO RESOLUTIONS

Resolution	Minimum video memory required for these color scales				Maximum refresh rates*
	256 colors (8 bits per pixel)	64 K colors hi-color (16 bits per pixel)	16.7 M colors true-color (24 bits per pixel)	16.7 M colors true-color (32 bits per pixel)	
640 X 480	2 MB				120 Hz
800 X 600	2 MB				120 Hz
1024 X 768	2 MB		4 MB		120 Hz
1152 X 882	2 MB		4 MB		120 Hz
1280 X 1024	2 MB	4 MB		8 MB	90 Hz
1600 X 1200	2 MB	4 MB	8 MB		72 Hz

*Your display may not support the maximum refresh rates shown here. Refer to the *User's Guide* supplied with your display for details of the refresh rates supported by your display.

NOTE	The video drivers supplied for your operating system will determine the available video resolutions and the number of displayable colors.
	SCO Unix supports 15 bits per pixel instead of 16 bits per pixel and provides no support 32 bits per pixel.
	OS/2 provides no support for 24 bits per pixel.

THE PC'S REAR CONNECTORS
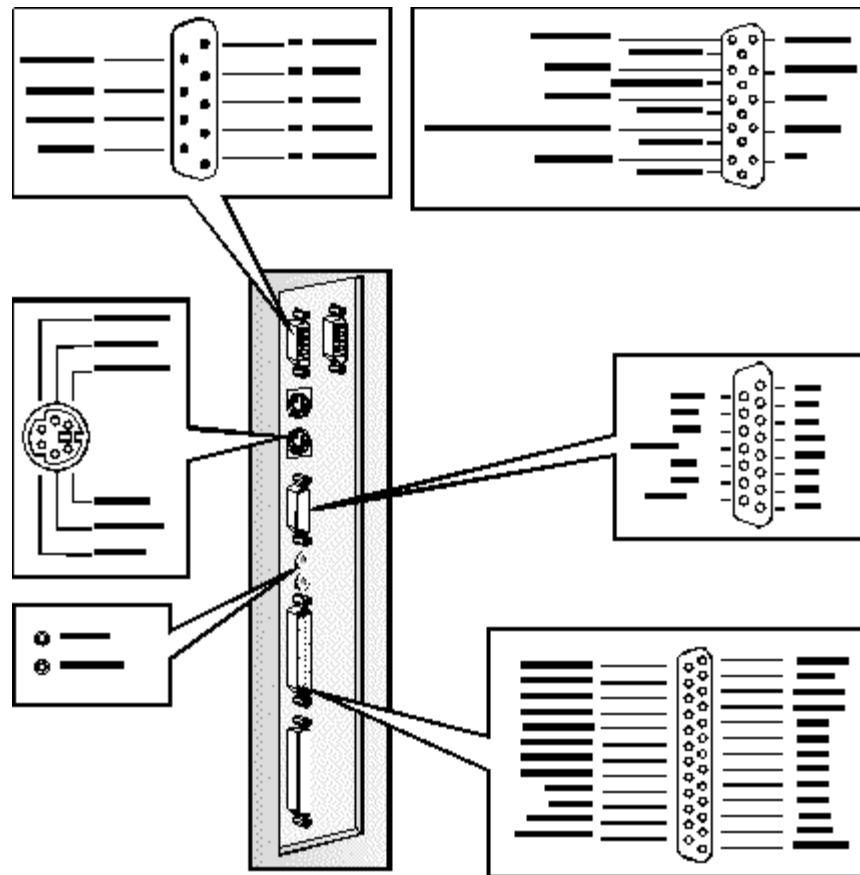
SYSTEM CONNECTORS AND SWITCHES

SYSTEM BOARD CONNECTORS

Fan Connector

Processor 1

Processor 2

Status Panel Connector

Primary IDE Connector

Flexible Drive Connector

Secondary IDE Connector

SCSI Connector

Microphone

CD-ROM Audio

PCI Slots

Audio Control Panel

Wavetable Connector

ISA Slots

Loudspeaker

External Start Connector

System Board Switches

VIDEO ADAPTER SWITCHES
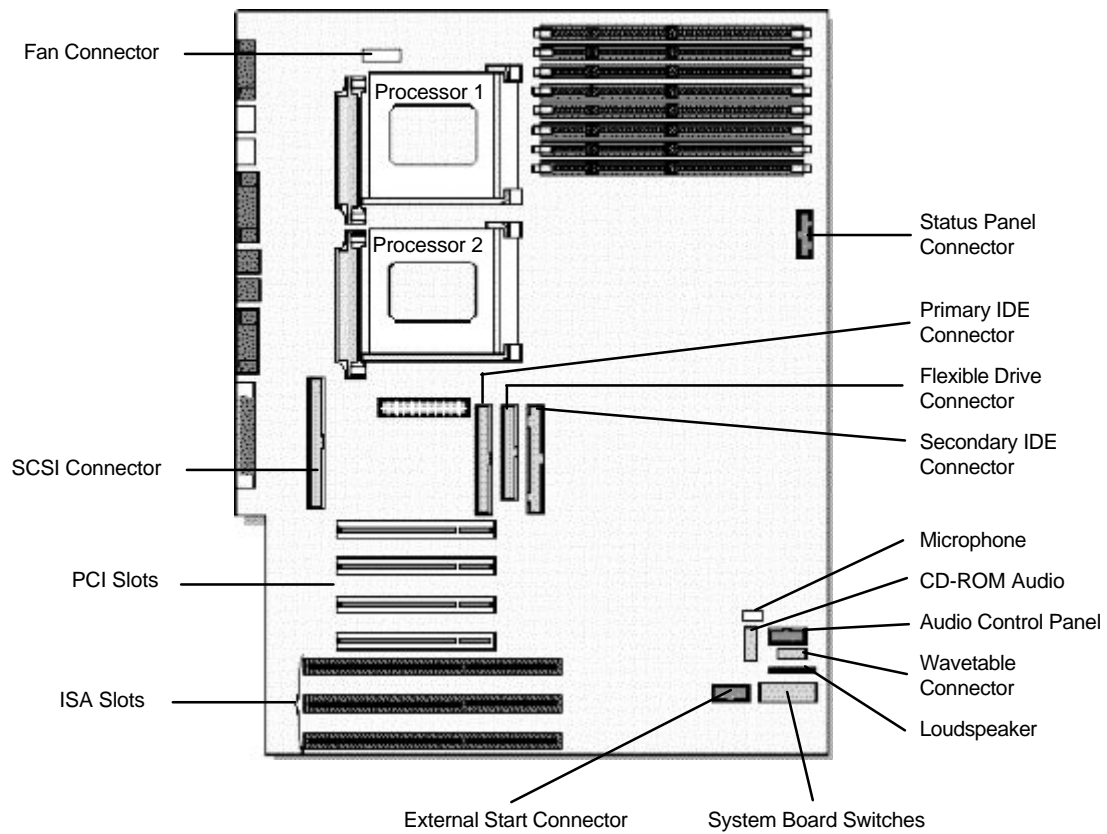
Video Adapter Switches
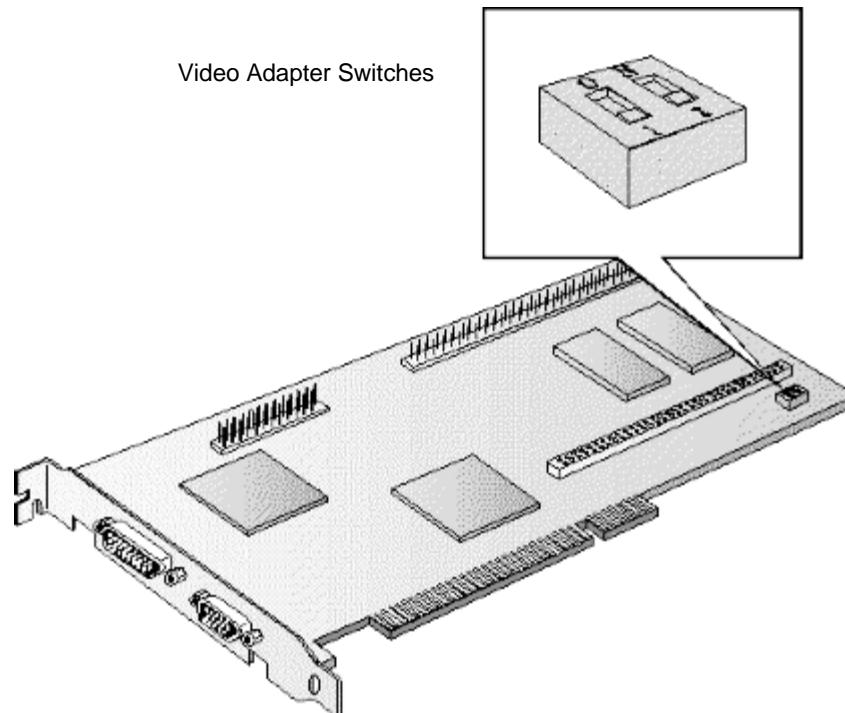
The Matrox video adapter has a Flash BIOS. This gives you the possibility of upgrading the video BIOS when updates are made available by Matrox.

Switch	Use Switch Block to:
1	Flash EEPROM Switch for VGA BIOS: • OFF to prevent Video BIOS upgrades — DEFAULT • ON to allow Video BIOS upgrades.
2	Enable or disable VGA for single-screen or dual-screen operation (with a second VGA controller): • OFF for single-screen operation — DEFAULT • ON for dual-screen operation (with a second VGA controller).

SYSTEM BOARD SWITCHES

System Board
Switches
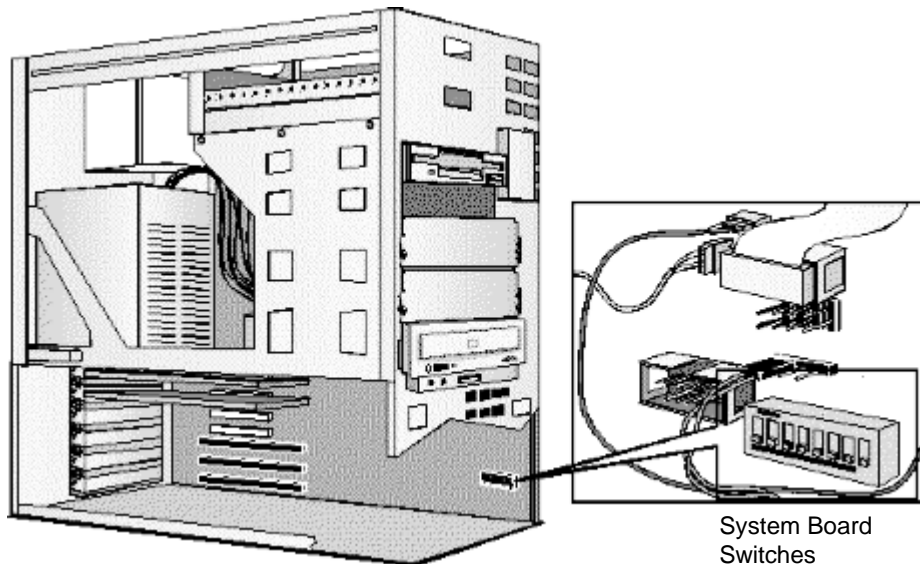
Switch	Use Switch Block to:
1 - CONFG	Retain or clear the configuration stored in EEPROM: • OFF to retain configuration — DEFAULT • ON to clear configuration.
2 - PSWRD	Enable or clear (and disable) User and System Administrator Passwords stored in EEPROM: • OFF to enable passwords — DEFAULT • ON to clear passwords.
3 - SECURE	Disable or enable security mode—security mode prevents changes to the PC's configuration with the Setup program: • OFF to disable security mode — DEFAULT • ON to enable security mode.

Switch 4	Switch 5	Switch 6	Switch 7	Switch 8	Bus Speed	Processor Speed
ON	OFF	ON	OFF	OFF	60 MHz	150 MHz
OFF	OFF	ON	OFF	OFF	66 MHz	166 MHz
ON	OFF	OFF	ON	OFF	60 MHz	180 MHz
OFF	OFF	OFF	ON	OFF	66 MHz	200 MHz

CAUTION: **These switch settings should not be changed, unless the processor is replaced by a faster (or slower) processor. Refer to the manual supplied with the replacement processor to verify which bus and processor speeds are supported.**

RECYCLING YOUR PC

HP has a strong commitment toward the environment. Your HP Personal Computer has been designed to respect the environment as much as possible.

HP can also take your old PC back for recycling when it reaches the end of its useful life.

HP has a product take-back program in several countries. The collected equipment is sent to one of HP's recycling facilities in Europe or the USA. As many parts as possible are reused. The remainder is recycled. Special care is taken for batteries and other potentially toxic substances, which are reduced into non-harmful components through a special chemical process.

If you require more details about HP's product take-back program, contact your dealer or your nearest HP Sales Office.

6 HEWLETT PACKARD SUPPORT AND INFORMATION SERVICES

INTRODUCTION

Hewlett Packard computers are engineered for quality and reliability to give you many years of trouble-free service. To ensure that your desktop system maintains its reliability and to keep you up-to-date with the latest developments, HP and a worldwide network of trained and authorized resellers provide a comprehensive range of service and support options which are listed below:

- HP Authorized Reseller
- HP SupportPack
- HP Support Assistant CD-ROM
- HP Information Services

Service	Means of Access
HP Forum on CompuServe	Modem
HP Forum on America Online (US only)	Modem
HP BBS Library	Modem
Internet FTP Library Service	FTP access to the Internet
HP Access World Wide Web Site	World Wide Web Access
HP FIRST Faxback	Phone and Fax
Audio Tips (US only)	Phone
HP Drivers/BIOS diskettes	Delivered by mail

- HP Support Services
  - Technical phone support
  - Lifeline phone support
  - Network phone-in support.

> **NOTE** When calling any of the international telephone numbers listed in this chapter, replace the '+' with your international telephone access code.

YOUR HP AUTHORIZED RESELLER

HP Authorized Resellers have been trained on HP Vectra equipment and are familiar with its configuration and environment. Authorized Resellers can also answer questions regarding non-HP hardware, software and systems as well as answer queries about usage not intended for, or not commonly used with the HP Vectra.

Authorized HP Resellers can also offer consulting services tailored to your specific needs regarding product development or custom installations, as will third party support services, or the HP Customer Support organization in your country.

HP SUPPORTPACK

HP's three-year SupportPack is available from your local reseller. It must be purchased within 30 days of purchasing your HP Vectra.

The concept of SupportPack is simple. It allows you to extend your one-year on-site hardware warranty to a three-year on-site hardware warranty, offering next day on-site response.

SupportPack is valid for the piece of equipment for which it was bought, but is not transferable from one piece of equipment to another.

HP SUPPORT ASSISTANT CD-ROM

HP Support Assistant is a yearly subscription service on CD-ROM. It is published four times a year.

Each CD-ROM contains information about Vectra PCs as well as other HP computing products. The types of information you can find include:

• Product manuals and service manuals
• Installation and configuration information
• Troubleshooting information
• Drivers and utilities
• Technical reference manuals.

Subscriptions to HP Support Assistant can be obtained with an order form which is available from the HP FIRST Faxback system. Request document number 9025 (US and Asia Pacific) or 19025 (Europe). Subscriptions can also be obtained by contacting the following numbers:

Region	Phone Number	Fax Number
Asia-Pacific	+65 740-4477	+65 740-4499
Europe	+31 (55) 384279	+31 (55) 434455
Latin America	+1 (317) 364-8882	+1 (317) 364-8888
US/Canada	1 (800) 457-1762	+1 (317) 364-8888

HEWLETT-PACKARD INFORMATION SERVICES

Hewlett Packard Electronic Information Services are available 24 hours per day, 7 days per week, ensuring that the most up-to-date information is always available.

HP FORUM ON COMPUSERVE

The HP Systems Forum on CompuServe is an on-line service, accessible via modem. This service provides information about your HP PC, and allows you to communicate with other HP users through an on-line user forum. HP users share their knowledge and experience with you, and you will be able to ask, or answer, technical questions about your HP Vectra PC, and HP products.

You can also download the latest versions of drivers, BIOS and software utilities for HP Vectra PCs.

As a preferred Hewlett Packard customer, you are invited to join CompuServe at no initial charge.

For the United States and the United Kingdom, call the number shown below and ask for representative 51. For all other locations, first call the worldwide number to obtain the number of your local sales office, then call your local sales office and ask for representative 51.

Country	Local Call / Freephone Number	Direct Number
United States	1 (800) 848-8199	+1 (614) 529-1349
United Kingdom	(0800) 289378	+44 (1272) 760680
Worldwide		+1 (614) 529-1349

CompuServe will send you a free introductory membership immediately, including information on how to access CompuServe.

At the CompuServe ! prompt, type **GO HP**.

HP FORUM ON AMERICA ONLINE

The HP Forum on America Online is an electronic information and communication service which can be accessed via modem.

To access the HP Forum:

- select **Keyword Search** from the menu,
- type **HP**,
- press [ENTER]

This will load the HP Home Page directly onto your screen.

In the HP Forum you can ask and answer questions about HP products and you can also download drivers, software application notes, or utilities for HP products.

Membership information can be obtained by calling 1(800) 827-6364, giving the preferred customer number 1118.

HP BBS LIBRARY

The HP electronic bulletin board library service contains the latest versions of drivers, BIOS, and utilities, which you can download to your PC using a modem. Support documentation is also available.

Country	Number	Baud Rate
United States	+1 (208) 344-1691	300, 1200, 2400, 4800, 9600, 14400
United Kingdom	+44 (1344) 3600880	up to 14400
Worldwide	+1 (208) 344-1691	300, 1200, 2400, 4800, 9600, 14400

Set your modem for no parity, 8 data bits, and 1 stop bit (N, 8, 1).

INTERNET—FTP LIBRARY SERVICE

Hewlett-Packard provides a library service which offers the latest versions of drivers, BIOS and utilities and other information about HP products. This library service is available if you have FTP access to the Internet, whatever your location.

Alias	ftp-boi.external.hp.com
Name	anonymous
Password	Enter your E-mail address

ACCESS HP WORLD WIDE WEB SITE

Access HP, HP's World Wide Web site gives you access to information about HP, its products, including product data sheets, service and support information, electronic newsletters and technical tips. You can also download the latest versions of drivers, BIOS and software utilities.

The Access Guide Directory guides you through the information and services available.

World-Wide Web URL   http://www.hp.com

HP FAXBACK ON DEMAND—HP FIRST

HP FIRST is a service where you can select documents, support and technical information, data sheets and pre-sales information, which are then faxed to you. To access this service, you can use a touch-tone phone and have the fax sent to the fax machine of your choice, or use the handset on your fax machine and dial one of the numbers given below:

Country/Region	Number	Access Method
United States	1 (800) 333-1917	Phone or fax
U.K.	(0800) 960271	Phone or fax
Australia	+61 (3) 9272-2627	Phone or fax
Singapore	+ 65 291-7951	Phone or fax
Hong Kong	+ 852 2506-2422	Phone or fax
New Zealand	+ 64 (9) 356-6642	Phone or fax
Europe	+ 31 (20) 681-5792	Phone or fax
Worldwide	+ 1 (208) 344-4809	Fax

A complete description of Hewlett-Packard electronic services is provided in document #9020.

HP AUDIO TIPS (USA ONLY) HP AUTOMATED SUPPORT DIRECTORY

HP Audio Tips is an automated system containing recordings which can direct you to Hewlett Packard support services. Live support is not available through this service.

Dial 1 (800) 333-1917 and press 3, to access HP Audio Tips.

ORDERING DRIVERS AND BIOS ON DISKETTE{XE "DRIVERS"}{XE "BIOS"}

You can order diskettes from HP, with the latest versions of drivers, BIOS and software utilities. The diskettes will be delivered by mail.

Information for ordering diskettes is set out in the table below:

North and Latin America	Europe
Phone +1 (970) 339 7009 Monday - Saturday 24 hours per day	**Phone** +44 (1429) 865511 Monday - Friday 8.30 a.m. - 6.00 p.m. Central European Time
Fax +1 (970) 330 7655	**Fax** +44 (1429) 866000
Mail US Driver Fulfillment for Hewlett-Packard PO Box 1754, Greeley, Colorado 80632 USA	**Mail** European Fulfillment for Hewlett-Packard c/o StarPak International, Ltd., Hartlepool, Cleveland,TS25 2YP United Kingdom

Australia	Asia - Pacific
Phone + 61 (2) 565 6099 Monday - Friday 8.30 a.m. - 5.30 p.m. Australian Eastern Time	**Phone** + 65 740 4477 Monday - Friday 8.30 a.m. - 5.30 p.m. Singapore Time
Fax + 61 (2) 519 5631	**Fax** + 65 740 4499
Mail Fulfill: Plus Pty Ltd., Private Bag 75, Alexandria NSW Australia 2015	**Mail** Fulfill: Plus Pte Ltd., No 51, Ubi Ave. 3, Singapore 1440

To identify a specific BIOS, driver or utility for your PC, please follow the steps listed below prior to placing your order.

- Contact your authorized HP reseller for assistance in selecting the appropriate driver.

- If your reseller is unable to help you, call HP FIRST for the most up-to-date list of drivers.

HP SUPPORT SERVICES

Hewlett-Packard provides a three year hardware warranty which includes on-site service during the first year after purchase, and a return service during the second and third years after purchase. This warranty coverage will apply from the nearest HP or HP authorized service outlet.

HP telephone support for your Vectra PC is available during the first year of your hardware warranty. This service will also provide technical assistance with the basic configuration and setup of your Vectra PC and for the pre-loaded operating system.

Lifeline Telephone support is available during the second and third years of hardware warranty, via the Lifeline program, which is a fee-based service.

The HP telephone support service does NOT provide free telephone support for PCs configured as network servers. If you do configure your PC as a network server, you are advised to contact your HP reseller to purchase a network phone-in support contract, which will provide you with a fee-based telephone support service.

NOTE	Reloading the software pre-loaded on your PC is not covered by your HP three-year warranty. HP strongly recommends that you make a set of master diskettes of this software as soon as possible after receiving your PC. To make the master diskettes, use the Master Diskette Creation Utility, which can be accessed from HP Utilities.

Your HP authorized reseller offers various service contracts which can be tailored to your particular support needs.

HEWLETT-PACKARD TELEPHONE SUPPORT

HP North American Customer Support Center

Assistance from the HP North American Customer Support Center is available Monday to Friday, 7:00 am to 6:00 pm Mountain time, except Wednesday when the hours are 7.00 am to 4:00 pm.

The number is: +1 (970) 635-1000

HP European Customer Support Center

Assistance from the HP European Customer Support Center is available in English, Monday to Friday, 8:30 am to 6:00 pm Central European time, except Wednesday when the hours are 8.30 am to 4:00 pm.

The number is: +31 (20) 581-3330

Other Regions

Contact your reseller who will be able to help you, or direct you to the appropriate HP telephone support service.

Please have the following information ready when you call so that your enquiry can be dealt with quickly:

- your HP Vectra model number and serial number
- the operating system version and the configuration
- a description of the software installed and the accessories used.

LIFELINE TELEPHONE SUPPORT

Lifeline is a fee-based telephone support program for Vectra PCs available after the one-year telephone support provided as part of the hardware warranty has expired.

Your call can either be charged to your phone bill at a per minute rate or to your credit card (Visa, Mastercard or American Express) at a flat fee.

The charge begins AFTER you have been put in contact with a support technician. If your problem is found to be covered by the HP Hardware Warranty, no charge will be applied.

In the US please call the appropriate number listed below.

Number	Method of Payment	Charge Type
1 (900) 555-1500	Charged to phone bill	per minute rate
1 (800) 999-1148	Charged to credit card	Flat fee

Free access to HP information services is not affected by this service. You are encouraged to access HP Information Services throughout the life of your PC, whether in or out of warranty.

HP NETWORK PHONE-IN SUPPORT SERVICE (NPS)

The HP Network Phone-in Support Service (NPS) provides fast access to HP experts in networked Multivendor environments.

It can help you to:

• resolve complex network problems,
• leverage HP's alliances with leading Network Operating Systems and Network manufacturers,
• support your HP and non-HP products with a single telephone call,
• increase network uptime.

You can purchase the HP NPS service as an annual contract, billable in advance annually, bi-annually, quarterly, or at an hourly rate. This contract service provides unlimited toll-free access to HP Response Center Engineers (RCEs).

To obtain an HP NPS contract, contact your HP authorized reseller, or if you are in the US call (800) 437-9140.

SUMMARY

The table below summarizes the services and support available from HP or authorized resellers.

Service	Covers	Period Covered	Response Time	Fee	When Available	Purchase From
Basic Warranty	Parts and labor for HP products: first year on-site, second and third year return to HP	Three years from date of purchase	Next working day for onsite	No charge	At time of purchase	HP
HP SupportPack Onsite Service	Parts and labor for HP products	First three years	Next working day	One fee which covers the three years	Within 30 days of purchase	HP Authorized reseller
HP Support Assistant	CD-ROM containing: Product Manuals, Technical Information and Product features	Released quarterly	N/A	Annual subscription	Anytime	HP
Electronic Services	Technical information, drivers, utilities, tools and diagnostics	Anytime	24-hour access	No charge	Anytime	HP BBS, Internet-FTP, WWW, CompuServe
Technical Phone Support	Basic assistance for PC setup, configuration, start-up and hardware diagnosis	First year	Business hours	No charge	At time of purchase	HP
Lifeline Phone Support	Basic assistance for PC setup, configuration, start-up and hardware diagnosis	After first year	Business hours	Per-call fee, no time limit	Anytime after first year	HP
HP Network Phone-in Support	Advanced remote technical support for multivendor networked environments	Annual contract	Business hours: 24-hour/ 7-day service also available	Annual fee, or minimum fee per incident	Anytime	HP Authorized reseller
Service Contracts	Technical Support	Customer defined	As required	Annual fee, or fee per incident	Anytime	Reseller

HEWLETT-PACKARD MARKETING HEADQUARTERS

Should you wish to contact Hewlett-Packard, check your local telephone directory for the HP Sales and Service Office near you. If you cannot find a convenient HP office, you can write to one of the major HP Sales and Service Offices or one of the Worldwide Marketing Headquarters listed here.

ASIA
Far East Sales Region Hdqtrs
Hewlett-Packard Asia Ltd.
22/F Peregrine Tower
Lipp Centre
89 Queensway, Central
Hong Kong

LATIN AMERICA
Hewlett-Packard Latin Am. Hdqtrs
Monte Pelvoux 111
Lomas de Chapultepec
11000 Mexico D.F.

EUROPE
European Operations Hdqtrs
Hewlett-Packard S.A.
150, route du Nant-d'Avril
P.O. Box 1217
Meyrin 2/Geneva
Switzerland

USA
Intercon Operations Hdqtrs
Hewlett-Packard Company
3495 Deer Creek Road
P.O. Box 10495
Palo Alto, CA 94303-0896
USA

MIDDLE EAST / AFRICA
Middle East / Central Africa Sales
Hdqtrs
Hewlett-Packard S.A.
Rue de Veyrot 39
CH-1217 Meyrin 1/Geneva
Switzerland

CANADA
Hewlett-Packard Ltd.
6877 Goreway Drive
Mississauga
Ontario L4V 1M8
Canada

HP WORLD WIDE WEB SERVER

Access the HP World Wide Web server for technical information, to download new drivers, utilities, and flash BIOS upgrades.

Point your WWW browser at: http://www.hp.com

HP ANONYMOUS FTP SERVER

Access the HP Anonymous FTP server to download new drivers, utilities, and flash BIOS upgrades.

FTP to IP address: xxx.x.xx.x

EUROPEAN CUSTOMER SUPPORT CENTER

For assistance from the HP European Customer Support Center, the number is: +00 000 0000.

HP WORLD WIDE WEB SERVER

Access the HP World Wide Web server for technical information, to download new drivers, utilities, and flash BIOS upgrades.

Point your WWW browser at: http://www.hp.com

HP ANONYMOUS FTP SERVER

Access the HP Anonymous FTP server to download new drivers, utilities, and flash BIOS upgrades.

FTP to IP address: xxx.x.xx.x

EUROPEAN CUSTOMER SUPPORT CENTER

For assistance from the HP European Customer Support Center, the number is: +00 000 0000.

GLOSSARY

100VG-AnyLAN

Refers to the 100 Mbit/s network technology over voice grade cable that is compatible with the proposed IEEE 802.12 standard. This technology guarantees access to any end node that requests to transmit, while ensuring priority access to end nodes that require consistent, continuous access for applications such as full-motion video or video conferencing.

adapter

An accessory board, that connects to the system board via an accessory board slot.

BBS

Bulletin Board System. A computer that uses a modem and software to serve as an information source for other computers equipped with a modem. Hewlett-Packard has a BBS that can be reached at +1 (408) 553-3500.

BIOS

Basic Input-Output System. Software that provides an interface between the computer hardware and the operating system.

bus

An electrical connection over which information is transported.

cache

A block of high-speed memory used for the temporary storage of data and processor instructions.

CD-ROM

Compact Disc Read Only Memory. A mass storage device that uses compact disc technology. CDs can store data, but most cannot be written to.

CMF

Filename extension for sound files saved in the Creative Labs, Inc. music data file format.

CMOS

Complementary Metal-Oxide Semiconduct or memory requires very little power to operate. The contents of your computer's CMOS memory are preserved when you turn off the computer. It is used to store information that must be maintained, such as your computer's configuration.

controller

A device that enables another device (such as a hard disk) to communicate with the computer.

DIMM

Dual In-line Memory Module. These memory modules provide a 64-bit data path for improved system performance.

device driver

Software that enables the computer to interface with a specific peripheral, such as a printer or display.

DSP

Digital Signal Processor.

ECC

Error Correcting Code can detect and correct data errors in memory modules.

expansion slot

A slot inside the computer, connected to the system board, that can be used for accessory boards.

extended memory

Memory which can be addressed by the processor in the area of memory above the first 1 MB.

IDE

Integrated Device Electronics. An interface standard for communicati ons between the computer and a hard disk or CD-ROM.

IRQ

Interrupt Request. A signal, that when received by the processor, halts the current process and allows a different task to be undertaken.

jumper

An electrically-conductive part that is used to connect two or more points on a circuit board. Commonly used to select configuration options.

LAN

Local Area Network. A general-purpose communications network that interconnects a variety of devices within a limited geographical area. A LAN might connect computers on adjacent desks, within a building, or within several buildings of a campus.

mass storage

Any device used to store large amounts of data. Usually refers to hard disks and tape backup units.

memory modules

Miniature boards containing memory chips. Used for increasing the amount of memory available in the computer.

MID files

Standard file format used to store MIDI sequence information.

MIDI

Musical Instrument Digital Interface. An international hardware/ software standard that specifies the cable and hardware interface that allows several devices, instruments, and computers to interchange music codes and events.

multimedia

Combining static media (such as text and pictures) with dynamic data (such as sound, video, and animation) on the same system.

network server mode

A security feature that prevents unauthorized use of an input device (like a keyboard or mouse) while your computer is running as an unattended network server.

OLE

Object Linking and Embedding. A Windows feature that allows different object types (such as speech clips or notes of music) to appear in a document. The objects can be linked, in which case they remain separate files, or embedded, where they become a part of the document.

pixel

Picture element. The smallest addressable spot on the screen.

Plug and Play

Plug and Play is an architecture designed to simplify installation and configuration of new devices in a PC.

POST

Power-On Self-Test. A series of tests your computer performs when you switch the computer on.

RAM

Random Access Memory. This memory is used to hold programs and data temporarily.

resolution

A measure of the visible detail on a screen or printout. Screen resolution is measured in 'pixels across' by 'pixels down' by 'number of colors'. Printer resolution is measured in dpi (dots-per-inch).

ROM

Read-Only Memory. Computer memory used to store parts of the computer's operating system permanently. ROM chips can contain instructions and data.

SCAM

SCSI Configured Automatically. A protocol which automatically assigns device IDs to SCSI devices which support SCAM.

SCSI

Small Computer System Interface. A high-speed data bus used for connecting hard disks, tape drives, and other accessories to your computer.

SCSI chain

Devices connected on a single SCSI bus.

Setup program

Used to inform the computer about its configuration, for example the amount of memory installed. The setup program is stored in ROM on the system board.

shadow RAM

A method of relocating the system and/or video BIOS from slower ROM chips to faster RAM to improve system performance.

SIMM

Single In-line Memory Module. These memory modules can provide a 32-bit data path.

Sound files

Files containing sound data. Sound files are usually stored in one of four formats, with the extension .WAV, .MID, .VOC, or .CMF.

terminator

A resistor at the end of a SCSI cable that prevents the signal from reflecting back along the cable.

video controller

A chip or expansion card which converts signals in the computer into displayable signals.

video RAM

Memory that enables or speeds up drawing to the screen or increases resolution or color options.

VOC files

Proprietary digital audio format developed by Creative Labs, Inc. Most digital audio adheres to the Microsoft WAV format.

WAV files

A Microsoft file format for storing digital audio data.

7 REGULATORY INFORMATION AND WARRANTY

REGULATORY INFORMATION

DECLARATION OF CONFORMITY
according to ISO/IEC Guide 22 and EN 45014

Manufacturer's Name and Address:

HEWLETT-PACKARD
Boulevard Steve Biko
38090 Villefontaine
FRANCE

Declares that the product:

    Product Name: Personal Computer

    Model Number: HP Vectra VE 5/series 2

Conforms to the following Product Specifications:

SAFETY	**International:**	IEC 950: 1991+A1+A2
		IEC 825-1: 1993 (*)
	Europe:	EN 60950: 1992+A1+A2
		EN 60825-1:1994 (*)

        (*) applicable when the product has a built-in CD-ROM Drive

EMC   International: CISPR 22: 1985 Class B

Europe: EN 50082-1: 1992
IEC 555-2:1982 + AI:1985 / EN 60555-2:1987
IEC 1000-3:1994 / EN 61000-3:1995
IEC 801-2: 1991 / prEN 55024-2: 1992 - 3 kV CD, 8 k V AD
IEC 801-2: 1991 / prEN 55024-3: - 3 V/m
IEC 801-4: 1988 / prEN 55024-4: 1992 / - 0.5 kV Signal Lines, 1 kV Power Lines

Supplementary information: The product complies with the requirements of the Low Voltage Directive 73/23/EEC and of the EMC Directive 89/336/EEC.

Grenoble   Gilbert BERTHET
January 1996   Quality Manager

FCC (FOR USA ONLY)

Federal Communications Commission Radio Frequency Interference Statement

Warning:

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates

and uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to correct the interference by one or more of the following measures:

- reorient or relocate the receiving antenna
- increase the separation between the equipment and the receiver
- connect the equipment into an outlet on a circuit different from that to which the receiver is connected
- consult the dealer or an experienced radio/TV technician for help.

Hewlett-Packard's system certification tests were conducted with HP-supported peripheral devices and HP shielded cables, such as those you receive with your system. Changes or modifications not expressly approved by Hewlett-Packard could void the user's authority to operate the equipment.

Notice for Canada

This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.
Cet appareil numérique de la Class B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

Safety Warning for the USA and Canada

If the power cord is not supplied with the computer, select the proper power cord according to your local national electric code.
USA: use a UL listed type SVT detachable power cord.
Canada: use a CSA certified detachable power cord.

For your safety, never remove the PC's cover without first removing the power cord and any connection to a telecommunication network. Always replace the cover before switching on again.

Changing a battery

There is a danger of explosion if the battery is incorrectlyinstalled. The old battery must be removed before installing a replacement battery. Replace only with the same or equivalent type recommended by the manufacturer.
For your safety, never attempt to recharge, disassemble or burn the old battery.
The battery in this PC is a lithium battery which does not contain heavy metals, nevertheless, in order to protect the environment, do not dispose of batteries in household waste.
Used batteries should be returned to the shop from which you bought them, to the dealer from whom you purchased the PC, or to Hewlett-Packard, so that they can either be recycled or disposed of in an environmentally sound way. Returned batteries will be accepted free of charge.

Notice for the United Kingdom

The HP Vectra PC is approved under approval number NS/G/1234/J/100003 for indirect connection to Public Telecommunication Systems within the United Kingdom.

Noise Declaration for Germany

Lärmangabe nach Maschinenlärmverordnung - 3 GSGV (Deutschland)
LpA < 70 db am Arbeitsplatz normaler Betrieb nach EN 27779:11.91

Notice for Japan

この装置は，第二種情報装置（住宅地域又はその隣接した地域において使用
されるべき情報装置）で住宅地域での電波障害防止を目的とした情報処理装置
等電波障害自主規制協議会（VCCI）基準に適合しております。

しかし，本装置をラジオ，テレビジョン受信機に近接してご使用になると，
受信障害の原因となることがあります。

取扱説明書に従って正しい取り扱いをして下さい。

Notice for Korea

이 기기는 비업무용으로 전자파장해검정을 받은 기기로서 주거지역에서는
물론 모두 지역에서 사용할 수 있습니다.

HP HARDWARE WARRANTY

IMPORTANT This is your hardware product warranty statement. Read it carefully.

Warranty terms may be different in your country. If so, your Authorized HP Dealer or Hewlett-Packard Sales and Service Office can give you details.

Three Year Limited Hardware Warranty

Hewlett-Packard (HP) warrants this hardware product against defects in materials and workmanship for a period of three years from receipt by the original end-user purchaser.

The three year warranty includes on-site service during the first year of use, and return service provided by an HP Service Center or a participating Authorized HP Personal Computer Dealer Repair Center, during the second and third years of use.

If HP receives notice of above defined defects during the warranty period, HP will either, at its option, repair or replace products which prove to be defective.

Should HP be unable to repair or replace the product within a reasonable amount of time, the customer's alternate exclusive remedy shall be a refund of the purchase price upon return of the product.

Limitation of Warranty

The above warranty shall not apply to defects resulting from: misuse; unauthorized modification; operation or storage outside the environmental specifications for the product; in-transit damage; improper maintenance; or defects resulting from use of non-HP software, accessories, media, supplies, consumables, or such items not designed for use with the product.

HP makes no other express warranty, whether written or oral, with respect to this product. Any implied warranty of merchantability or fitness is limited to the three-year duration of this written warranty.

Some states or provinces do not allow limitations on how long an implied warranty lasts, so the above limitation or exclusion may not apply to you.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state, or province to province.

Limitation of Liability and Remedies

The remedies provided above are the customer's sole and exclusive remedies.

In no event shall HP be liable for any direct, indirect, special, incidental, or consequential damages, whether based on warranty, contract, tort, or any other legal theory.

The foregoing limitation of liability shall not apply in the event that any HP product sold hereunder is determined by a court of competent jurisdiction to be defective and to have directly caused bodily injury, death, or property damage; provided, that in no event shall HP's liability for property damage exceed the greater of $50,000 or the purchase price of the specific product that caused such damage.

Some states or provinces do not allow the exclusion or limitation of incidental or consequential damages–including lost profit–so the above limitation or exclusion may not apply to you.

Obtaining On-Site Warranty Service

To obtain on-site warranty service, the customer must contact an HP Sales and Service Office (in the US, call the HP Customer Support Center at (303) 635-1000) or a participating Authorized HP Personal Computer Dealer Repair Center and arrange for on-site repair of the product. The customer must be prepared to supply proof of the purchase date.

This warranty is extended worldwide to products purchased from HP or an Authorized HP Personal Computer Dealer which are reshipped by the original purchaser either for use by the original purchaser or provided as an incidental part of systems integrated by the original purchaser. Service is provided in the same manner as if the product was purchased in the country of use and can only be provided in countries where the product is designed to operate. If the product is not normally sold by HP in the country of use, it must be returned to the country of purchase for service.

The system processor unit, keyboard, mouse, and Hewlett-Packard accessories inside the system processor unit–such as video adapters, mass storage devices, and interface controllers–are covered by this warranty.

Customer-replaceable components–such as the keyboard or mouse–may be serviced through expedited part shipment. In this event, HP will prepay shipping charges, duty, and taxes; provide telephone assistance on replacement of the component; and pay shipping charges, duty, and taxes for any part that HP asks to be returned.

HP products external to the system processor unit–such as external storage subsystems, displays, printers, and other peripherals–are covered by the applicable warranties for those products; HP software is covered by the HP Software Product Limited Warranty.

On-site visits caused by non-Hewlett-Packard products–whether internal or external to the system processor unit–are subject to standard per-incident travel and labor charges.

On-site service for this product is restricted or unavailable in certain locations. In HP Excluded Travel Areas–areas where geographical obstacles, undeveloped roads, or unsuitable public transportation prohibit routine travel–service is provided on a negotiated basis at extra charge.

Response time for HP on-site service in an HP Service Travel Area is normally next business day (excluding HP holidays) for HP Travel Zones 1-3 (generally 100 miles or 160 Km from the HP office). Response time is second business day for Zones 4 and 5 (200 miles, 320 Km); third business day for Zone 6 (300 miles, 480 Km); and negotiated beyond Zone 6. Worldwide Customer Support Travel information is available from any HP Sales and Service Office.

Travel restrictions and response time for dealer or distributor service are defined by the participating dealer or distributor.

Service contracts which provide after-hour or weekend coverage, faster response time, or service in an Excluded Travel Area are often available from HP, an authorized dealer, or authorized distributor at additional charge.

Customer Responsibilities

The customer may be required to run HP-supplied diagnostic programs before an on-site visit or replacement part will be dispatched.

The customer is responsible for the security of its proprietary and confidential information and for maintaining a procedure external to the products for reconstruction of lost or altered files, data, or programs.

For on-site service, the customer must provide: access to the product; adequate working space and facilities within a reasonable distance of the product; access to and use of all information and facilities determined necessary by HP to service the product; and operating supplies and consumables such as the customer would use during normal operation.

When service is being performed on-site, a representative of the customer must be present at all times. The customer must state if the product is being used in an environment which poses a potential health hazard to repair personnel; HP or the servicing dealer may require that the product be maintained by customer personnel under direct HP or dealer supervision.

Obtaining Return Warranty Service

When return warranty service applies, the product must be returned to a service facility designated by HP. Customer must enclose a copy of a document proving date of purchase.

The customer shall prepay shipping charges (and shall pay all duty and taxes) for products returned to HP for warranty service. HP shall pay for return of products to the customer except for products returned to the customer from another country.

HP products may contain remanufactured parts equivalent to new in performance or may have been subject to incidental use.

HP SOFTWARE PRODUCT LICENSE AGREEMENT AND SOFTWARE & PRODUCT LIMITED WARRANTY

The HP Software Product License Agreement and Product Limited Warranty shall govern all Software which is provided to you, the Customer, as part of the HP computer product. This HP Software Product Agreement and Product Limited Warranty shall supersede any non-HP software license or warranty terms which may be found in any documentation or other materials contained in the computer product packaging.

CAREFULLY READ THIS LICENSE AGREEMENT BEFORE PROCEEDING TO OPERATE THIS EQUIPMENT. RIGHTS IN THE SOFTWARE ARE OFFERED ONLY ON THE CONDITION THAT THE CUSTOMER AGREES TO ALL TERMS AND CONDITIONS OF THE

LICENSE AGREEMENT. PROCEEDING TO OPERATE THE EQUIPMENT INDICATES YOUR ACCEPTANCE OF THESE TERMS AND CONDITIONS. IF YOU DO NOT AGREE TO THE LICENSE AGREEMENT, YOU MUST NOW EITHER REMOVE THE SOFTWARE FROM YOUR HARD DISK DRIVE AND DESTROY THE MASTER DISKETTES, OR RETURN THE COMPLETE COMPUTER AND SOFTWARE FOR A FULL REFUND.

Software License Agreement

In return for payment of the applicable fee, Hewlett-Packard grants the Customer a license in the software, subject to the following:

1. USE. Customer may use the software on any one computer. Customer may not network the software or otherwise use it on more than one computer. Customer may not reverse assemble or decompile the software unless authorized by law.

2. COPIES AND ADAPTATIONS. Customer may make copies or adaptations of the software (a) for archival purposes or (b) when copying or adaptation is an essential step in the use of the software with a computer so long as the copies and adaptations are used in no other manner.

3. OWNERSHIP. Customer agrees that he/she does not have any title or ownership of the software, other than ownership of the physical media. Customer acknowledges and agrees that the software is copyrighted and protected under the copyright laws. Customer acknowledges and agrees that the software may have been developed by a third party software supplier named in the copyright notices included with the software, who shall be authorized to hold the Customer responsible for any copyright infringement or violation of this Agreement.

4. TRANSFER OF RIGHTS IN SOFTWARE. Customer may transfer rights in the software to a third party only as part of the transfer of all rights and only if Customer obtains the prior agreement of the third party to be bound by the terms of this License Agreement. Upon such a transfer, Customer agrees that his/her rights in the software are terminated and that he/she will either destroy his/her copies and adaptations or deliver them to the third party.

5. SUBLICENSING AND DISTRIBUTION. Customer may not lease, sublicense the software or distribute copies or adaptations of the software to the public in physical media or by telecommunication without the prior written consent of Hewlett-Packard.

6. TERMINATION. Hewlett-Packard may terminate this software license for failure to comply with any of these terms provided Hewlett-Packard has requested Customer to cure the failure and Customer has failed to do so within thirty (30) days of such notice.

7. UPDATES AND UPGRADES. Customer agrees that the software does not include updates and upgrades which may be available from Hewlett-Packard under a separate support agreement.

8. EXPORT CLAUSE. Customer agrees not to export or re-export the software or any copy or adaptation in violation of the U.S. Export Administration regulations or other applicable regulation.

9. GOVERNMENT RESTRICTED RIGHTS. Use, duplication, or disclosure by the U.S. Government is subject to restrictions as set forth in subparagraph (c)(1)(ii) of the Rights in Technical Data and Computer Software clause in DFARS 252.227-7013. Hewlett-Packard Company. 3000 Hanover Street, Palo Alto, CA 94304 U.S.A. Rights for non-DOD U.S. Government Departments and Agencies are as set forth in FAR 52.227-19(c)(1,2).

Software Product Limited Warranty

Ninety-Day Limited Software Warranty

HP warrants for a period of NINETY (90) DAYS from the date of the purchase that the software product will execute its programming instructions when all files are properly installed. HP does not warrant that the operation of the software will be uninterrupted or error free. In the event that this software product fails to execute its programming instructions during the warranty period, Customer's remedy shall be a refund or repair. Should HP be unable to replace the media within a reasonable amount of time, Customer's alternate remedy shall be a refund of the purchase price upon return of the product and all copies.

Removable Media (If supplied)

HP warrants the removable media, if supplied, upon which this product is recorded to be free from defects in materials and workmanship under normal use for a period of NINETY (90) DAYS from the date of purchase. In the event the media proves to be defective during the warranty period, Customer's remedy shall be to return the media to HP for replacement. Should HP be unable to replace the media within a reasonable amount of time, Customer's alternate remedy shall be a refund of the purchase price upon return of the product and destruction of all other nonremovable media copies of the software product.

Notice of Warranty Claims

Customer must notify HP in writing of any warranty claim not later than thirty (30) days after the expiration of the warranty period.

Limitation of Warranty

HP makes no other express warranty, whether written or oral with respect to this product. Any implied warranty of merchantability or fitness for a particular purpose is limited to the 90-day duration of this written warranty. Some states or provinces do not allow limitations on how long an implied warranty lasts, so the above limitation or exclusion may not apply to you.

This warranty gives specific legal rights, and you may also have other rights which vary from state to state, or province to province.

Limitation of Liability and Remedies

THE REMEDIES PROVIDED ABOVE ARE CUSTOMER'S SOLE AND EXCLUSIVE REMEDIES. IN NO EVENT SHALL HP BE LIABLE FOR ANY DIRECT, INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES (INCLUDING LOST PROFIT) WHETHER BASED ON WARRANTY, CONTRACT, TORT OR ANY OTHER LEGAL THEORY. Some states or provinces do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

Obtaining Warranty Service

Warranty service may be obtained from the nearest HP sales office or other location indicated in the owner's manual or service booklet.

Consumer transactions in Australia and the United Kingdom: The disclaimers and limitations above shall not apply and shall not affect the statutory rights of a Consumer.